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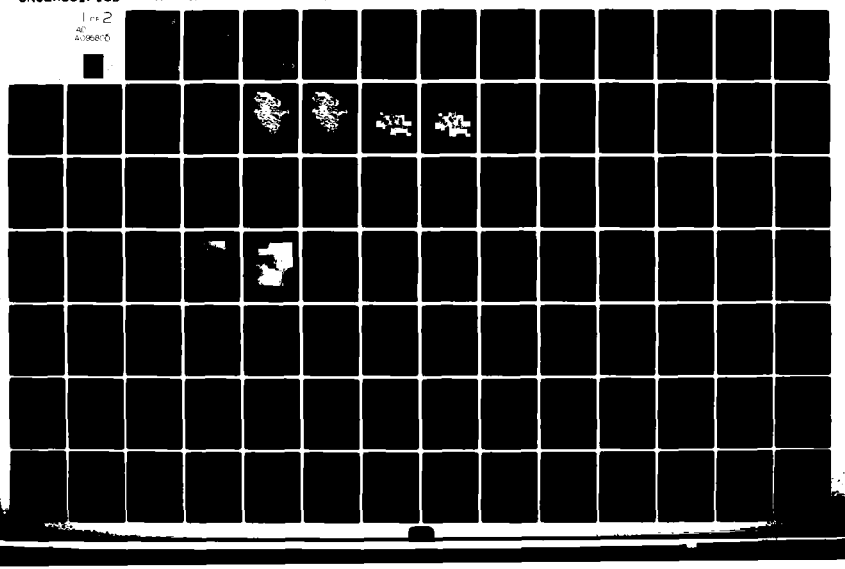

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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This report was prepared as part of the enviornmental analysis process for the M-X Missile Program. It documents the data, assumptions, and methods used in estimating the critical economic and demographic impacts of deploying the M-X missile in Nevada/Utah, Texas/New Mexico, or both. The impact estimates themselves are reported and discussed in the Deployment Area Selection and Land Withdrawal Acquisition Draft Environmental Impact Statement. More detailed impact estimates are reported in other Enviornmental Technical Reports in this series (see particularly ETRs 2 through 9).

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M-X ETR-27

M-X ENVIRONMENTAL TECHNICAL REPORT: ECONOMIC MODEL

Prepared for

U.S. Air Force
Ballistic Missile Office
Norton AFB, California

By

Henningson, Durham & Richardson Sciences
Santa Barbara, California

22 December 1980

PREFACE

This report was prepared as part of the environmental analysis process for the M-X Missile program. It documents the data, assumptions, and methods used in estimating the critical economic and demographic impacts of deploying the M-X missile in Nevada/Utah, Texas/New Mexico, or both. The impact estimates themselves are reported and discussed in the Deployment Area Selection and Land Withdrawal Acquisition Draft Environmental Impact Statement. More detailed impact estimates are reported in other Environmental Technical Reports in this series (see particularly ETRs 2 through 9).

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REGIONAL INTERINDUSTRY ANALYSIS OF THE ECONOMIC IMPACTS OF THE M-X SYSTEM

1.0 INTRODUCTION

This report documents the methods, assumptions, and data used to estimate the regional economic impacts of M-X deployment. The central component of this analysis is a system of county-level interindustry models drawing on a modified version of the Regional Industrial Multiplier System (R.I.M.S.). These models, combined with estimates of the final demand changes associated with M-X deployment, permit projection of the project's direct and indirect economic effects. A description of R.I.M.S. is provided as Appendix D to this report.

The direct economic effects of the M-X project originate at specific geographic locations. Construction camps represent points of employment and earnings for construction and assembly and checkout personnel. The locations of operating bases likewise constitute sites of employment and earnings for construction, assembly and checkout, and operations personnel. Base sites also are assumed to be the points of origin for local materials procurement.

Significant consequences of direct project-related economic activities are, however, distributed over a broad region. This analysis makes specific assumptions about the regional distribution of project-related expenditures which originate at specific points. These expenditures constitute changes in final demand for county-level interindustry models which then estimate direct and indirect earnings, employment, labor force, and population effects in each study-region county.

The county-level models are impact models designed to use exogenous baseline projections of county population, labor force, employment, and unemployment. Project-related employment, earnings, labor force, and population changes are added to the exogenous baseline to estimate the values of these variables in each county with the project.

The study uses one year as the basic time unit of analysis, and consists of the following specific elements:

(1) calculating direct project employment, earnings, procurement, and related investment effects on the economy of the deployment region;

(2) estimating the probable distribution of project-related demands across the counties within the region;

(3) deriving gross output (sales) changes for the economy of each county based on the demands of the project and the R.I.M.S. multipliers estimated for that county;

(4) tracing changes in gross output through changes in wage and salary earnings and employment indirectly related to the project;

(5) calculating total M-X-related employment (direct plus indirect) by county of residence and comparing it to the labor force in each county projected to be available for employment under no-project conditions;

(6) estimating net labor force migration into each county in the region based on the excess of project-related employment over the locally available supply of labor;

(7) projecting M-X-related increases in population from the amount of labor force in-migration; and

(8) determining the probable distribution of population changes among communities, construction camps, and operating bases.

The analysis considers all the alternatives included in the M-X Deployment Area Selection and Land Withdrawal/Acquisition Draft Environmental Impact Statement. It also considers both the Nevada/Utah and Texas/New Mexico deployment regions.

2.0 PROJECT-RELATED EXPENDITURES AND REGIONS OF INFLUENCE

Deployment of the M-X system will require expenditures for labor and materials for construction, assembly and checkout, and operations. This section discusses the way these direct project impacts are estimated and distributed across the deployment regions.

2.1 M-X SYSTEM PERSONNEL REQUIREMENTS

The M-X system's direct labor demands will be spread across a broad geographical area. Figures 2.1-1 through 2.1-4 display the locations of the Designated Deployment Area (DDA) facilities and camps where construction personnel and assembly and checkout workers are assumed to be employed for each of the full and split deployment alternatives considered in this analysis.

Potential operating base (OB)- locations - Coyote Spring and Ely, Nevada; Beryl, Milford, and Delta, Utah, Clovis, New Mexico; and Dalhart, Texas - also represent the places of employment for operating base construction, assembly and checkout, and operations personnel employed on the project.

Table 2.1-1 summarizes the principal features of each of the alternatives analyzed in this study. The Proposed Action and six of the eight project alternatives are sited completely in Nevada/Utah, and one of the alternatives would be entirely in Texas/New Mexico (Alternative 7). The split deployment option (Alternative 8) sites an operating base in Coyote Spring Valley, Nevada, and one-half of the missile force in Nevada/Utah. Split deployment also would locate a base at Clovis, New Mexico, and half (100) of the missiles in Texas/New Mexico.

Tables 2.1-2 through 2.1-23 present the personnel requirements data used in this analysis. The direct labor demands of the M-X system consist of three basic types:

- o construction of the Designated Deployment Area (DDA) and OB facilities;
- o assembly and checkout of the DDA and OB facilities; and
- o operation of system.

Operations employment is defined in this study to include officers, enlisted personnel, and civilians. The construction camp numbers in Figures 2.1-1 through 2.1-4 correspond to the camp numbers shown in the employment tables for DDA construction and assembly and checkout. Data also are provided on DDA construction and assembly and checkout employment by county, with the locations of the camps determining the county of employment.

The methods and assumptions used in deriving the estimates of construction labor requirements presented in the direct-employment tables are documented in Technical Report on M-X Construction, HDR Sciences, ETR-590, 9 September 1980.

The general trends in direct employment are visible from a survey of the data for full deployment in Nevada/Utah (Tables 2.1-2 through 2.1-7). M-X employment

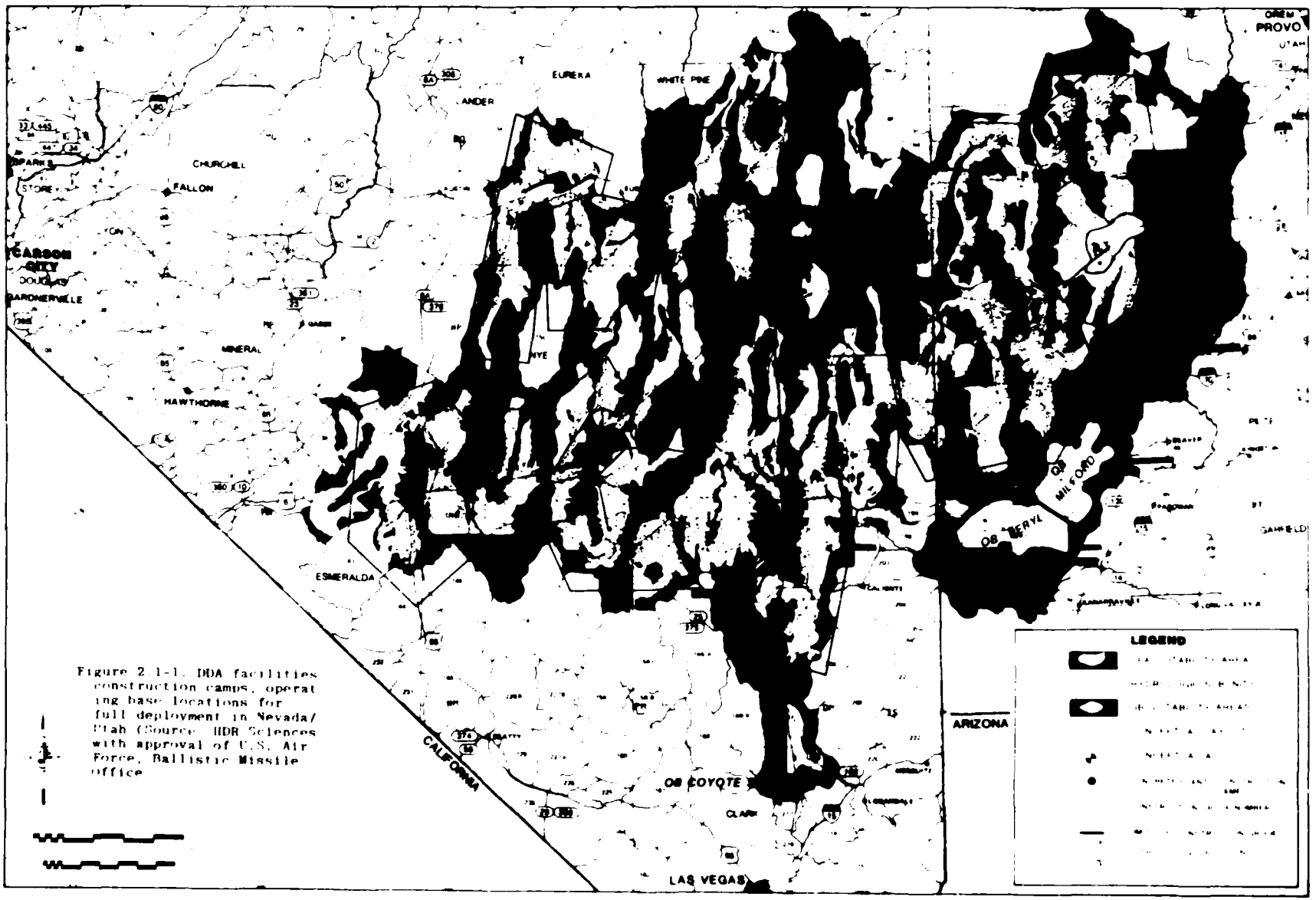

Figure 2.1-1. DDA facilities construction camps, operating base locations for full deployment in Nevada/Utah (Source: HDR Sciences with approval of U.S. Air Force, Ballistic Missile office

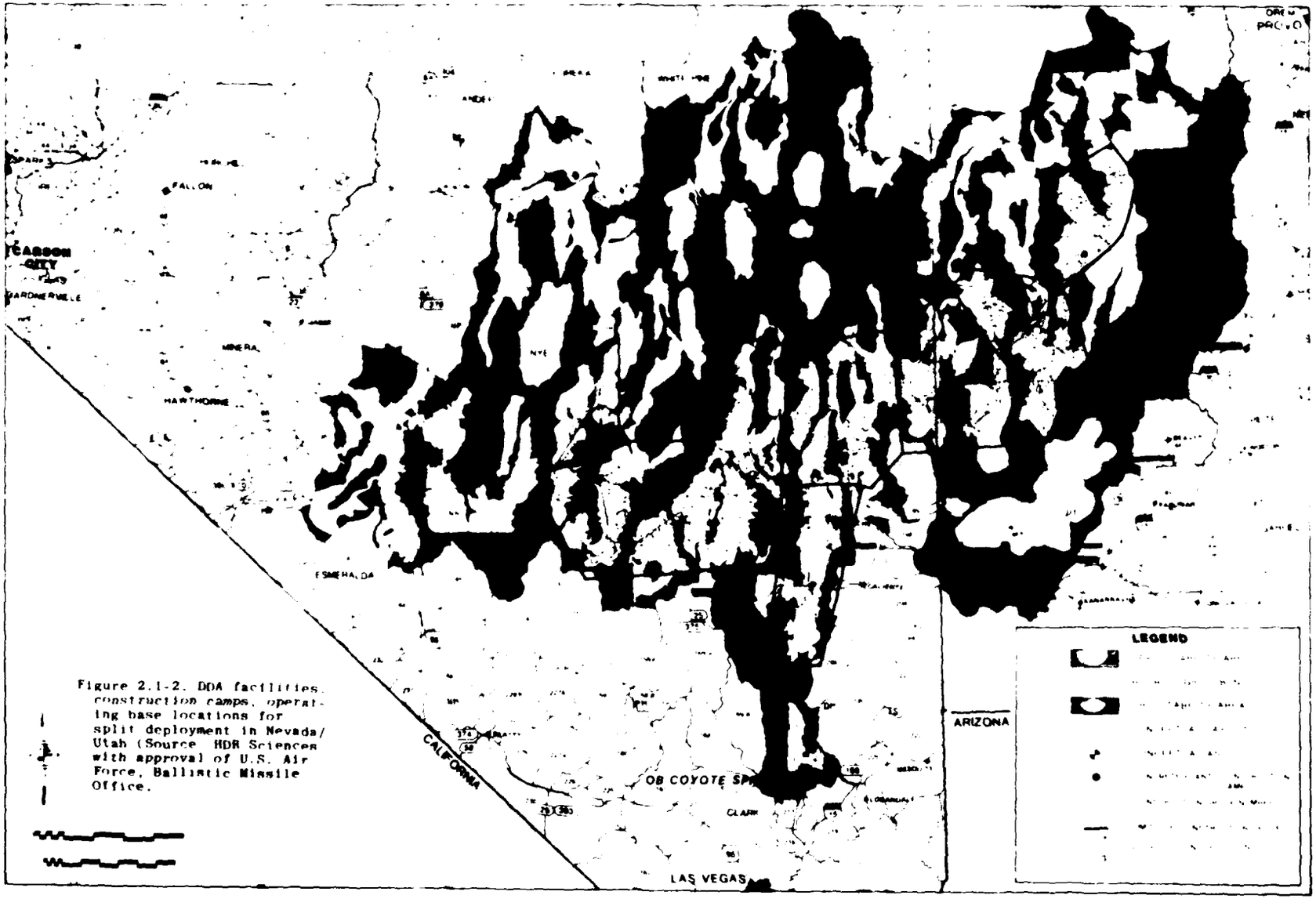

Figure 2.1-2. DDA facilities, construction camps, operating base locations for split deployment in Nevada/Utah (Source: HDR Sciences with approval of U.S. Air Force, Ballistic Missile Office.

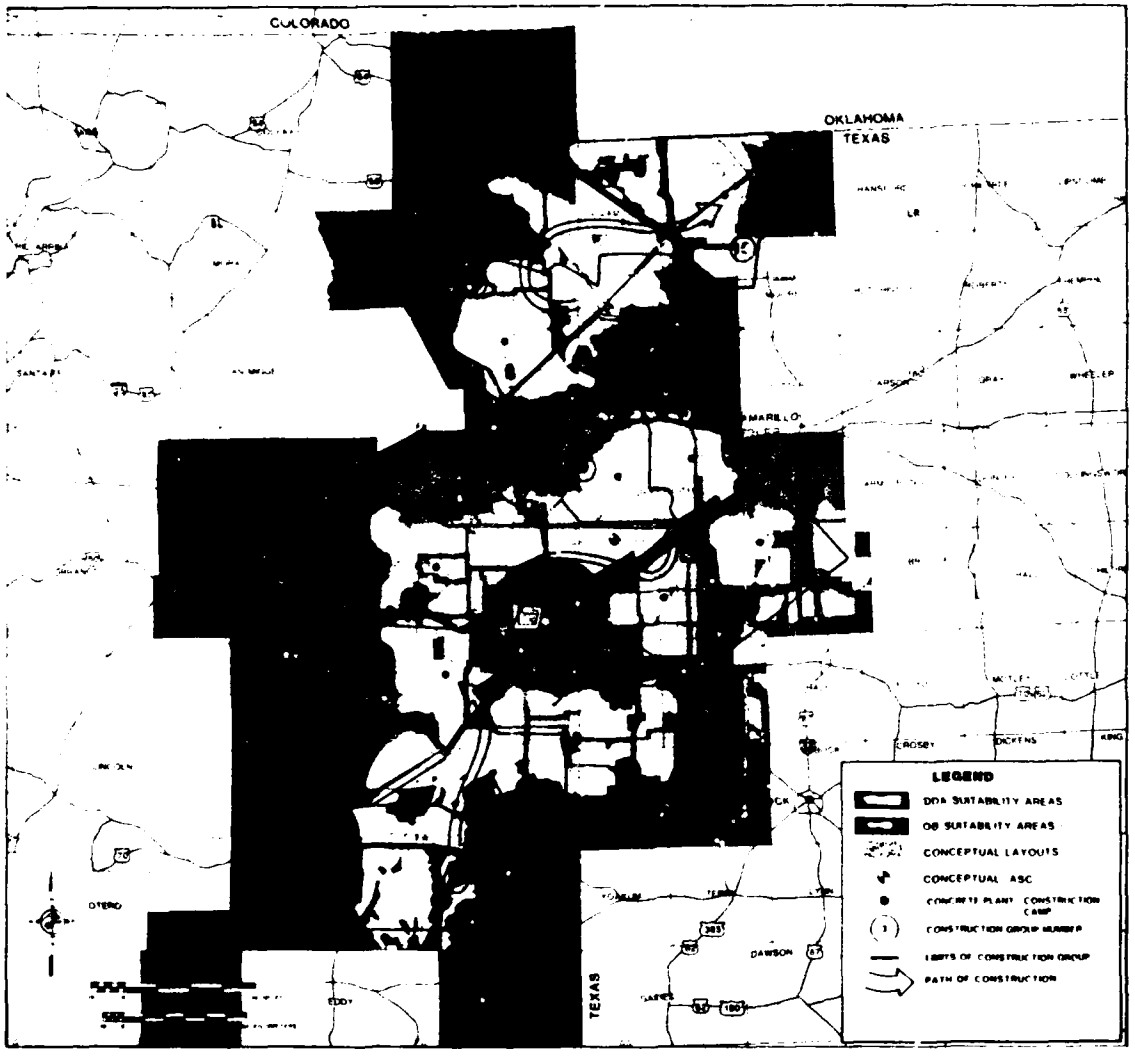

Figure 2.1-3. DDA facilities, construction camps, operating base locations for full deployment in Texas/New Mexico (Source: HDR Sciences with approval of the U.S. Air Force, Ballistic Missile Office.

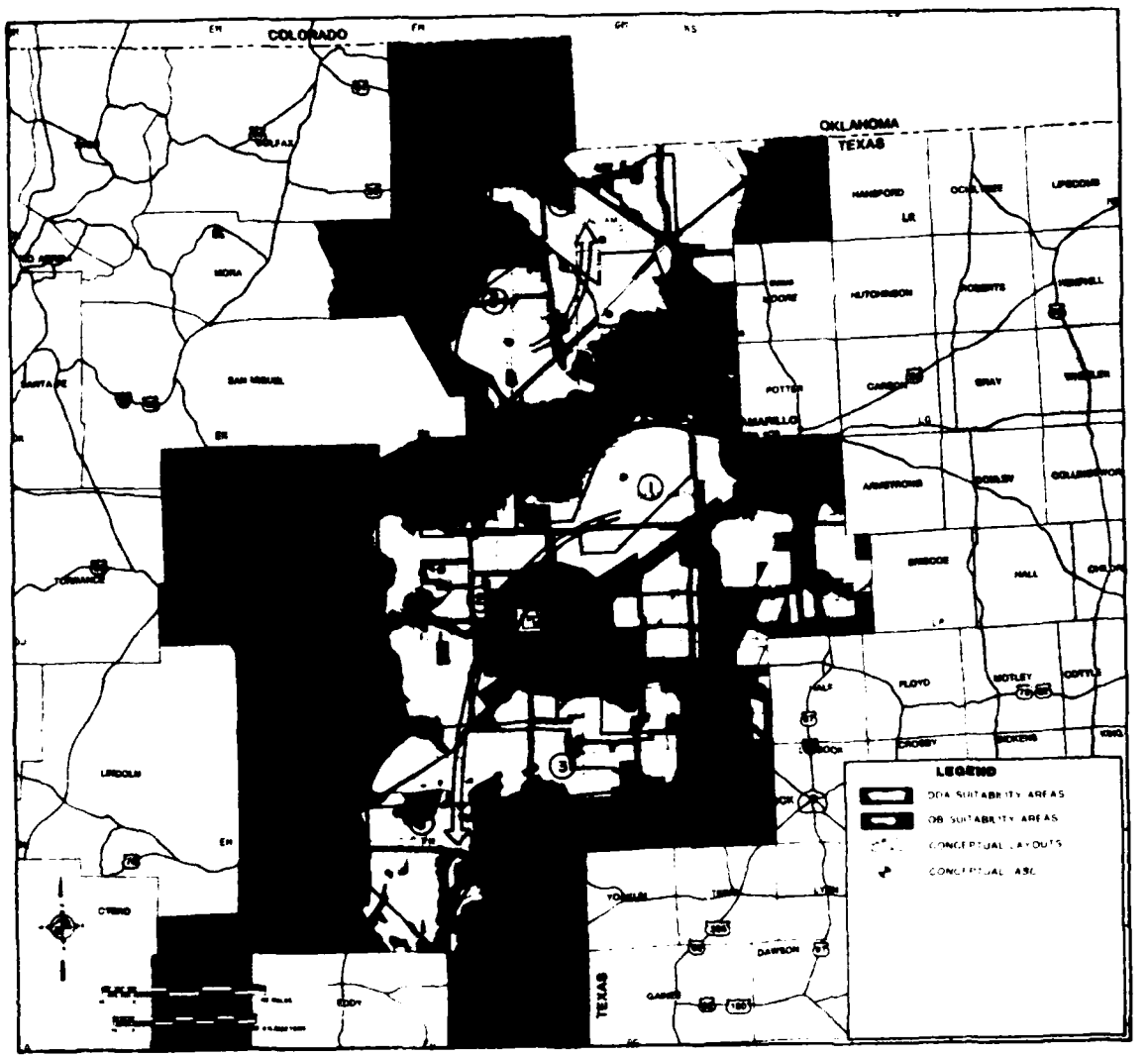

Figure 2.1-4. DDA facilities, construction camps, operating base locations for split deployment in Texas/New Mexico (Source: HDR Sciences, with approval of the U.S. Air Force, Ballistic Missile Office.

Table 2.1-1. Alternatives analyzed in the M-X deployment area selection and land withdrawal draft environmental impact statement.

ALTERNATIVE	FIRST BASE[1]	SECOND BASE[2]	FIGURE NUMBER
Proposed Action	Coyote Spring Valley, NV	Milford, UT	2.1-1
Alternative 1	Coyote Spring Valley, NV	Beryl, UT	2.1-1
Alternative 2	Coyote Spring Valley, NV	Delta, UT	2.1-1
Alternative 3	Beryl, UT	Ely, NV	2.1-1
Alternative 4	Beryl, UT	Coyote Spring Valley, NV	2.1-1
Alternative 5	Milford, UT	Ely, NV	2.1-1
Alternative 6	Milford, UT	Coyote Spring Valley, NV	2.1-1
Alternative 7	Clovis, NM	Dalhart, TX	2.1-2
Alternative 8[3]	Coyote Spring Valley, NV	Clovis, NM	2.1-3 & 2.1-4

3971

[1]First Base includes DDA, OBTS and OB.

[2]Second Base for proposed action and alternatives 1-7 includes just the OB; for split basing (Alternative 8, the second base includes DDA and OB, but no OBTS.

[3]Deployment for split basing includes 100 missiles in the Nevada/Utah region and 100 missiles in the Texas/New Mexico region.

Source U.S. Air Force, Ballistic Missile Office.

Table 2.1-2. Total M-X system personnel requirements, full deployment in Nevada/Utah, 1982-1991.

DESCRIPTION	PERSONNEL									
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Construction										
Technical Facilities (DDA)[1]		100	2,150	8,400	14,500	13,400	11,600	4,050		
Base I[2]	1,150	1,900	2,300	2,000	1,200					
Base II[3]				400	1,350	2,050	1,450	750		
Subtotal	1,150	2,000	4,450	10,800	17,050	15,450	13,050	4,800		
A & CO										
Technical Facilities (DDA)[1]		50	100	1,750	3,150	3,150	3,100	3,100	50	
Base I[2]		350	900	1,800	2,850	2,850	2,800	2,650	50	
Base II[3]		—	—	—	—	—	—	—	—	
Subtotal		400	1,000	3,550	6,000	6,000	5,900	5,750	100	
Operations										
Base I[2]			1,250	2,500	3,750	5,000	6,250	7,500	7,500	7,500
Base II[3]					1,400	2,800	4,250	5,700	5,700	5,700
Subtotal			1,250	2,500	5,150	7,800	10,500	13,200	13,200	13,200
Total	1,150	2,400	6,700	16,850	28,200	29,250	29,450	23,750	13,300	13,200

2165

[1]Dedicated Deployment Area includes Protective Structures (PS), Area Support Centers (ASC), Security Alert Facilities (SAF), Designated Transportation Network (DTN), Cluster Maintenance Facilities (CMF), Remote Security System (RSS), and Cluster Roads.

[2]Base I includes Designated Assembly Area (DAA), Operating Base Test Site (OBTS), and airfield.

[3]Base II includes an airfield.

NOTE: Nevada/Utah full deployment alternatives differ only in the location of operating bases, not in employment levels.

Source: HDR Sciences, with approval of U.S. Air Force, Ballistic Missile Office.

Table 2.1-3. Personnel required for construction of DDA facilities and operating bases, full deployment in Nevada/Utah, 1982-1989.

CAMP NUMBER[1]	CONSTRUCTION PERSONNEL							
	1982	1983	1984	1985	1986	1987	1988	1989
01		100	950	1,600	250			
02				50	1,700	1,700	150	
03			200	1,350	1,650	350		
04					150	1,350	1,400	
05						150	1,300	1,050
06			550	1,800	1,200			
07					600	1,450	700	
08				150	1,150	1,350	50	
09			350	1,200	2,400	600		
10					100	1,000	2,000	700
11			50	750	1,250	50		
12						1,200	1,000	50
13					100	1,250	2,300	1,300
14				650	1,100			
15			50	750	1,450	250		
16				100	1,150	400		
17					250	1,550	950	
18						750	1,750	950
Subtotal		100	2,150	8,400	14,500	13,400	11,600	4,050
Base I	1,150	1,900	2,300	2,000	1,200			
Base II				400	1,350	2,050	1,450	750
Total	1,150	2,000	4,450	10,800	17,050	15,450	13,050	4,800

2330

[1]See Figure 2.1-1.

Source: HDR Sciences, with approval of U.S. Air Force Ballistic Missile Office.

Table 2.1-4. Personnel required for assembly and check-out of DDA facilities and operating bases, full deployment in Nevada/Utah, 1983-1990.

CAMP NUMBER[1]	A & CO PERSONNEL							
	1983	1984	1985	1986	1987	1988	1989	1990
01	50	40	330	60				
02			10	360	400	30		
03		10	280	360	80			
04				30	320	380		
05					30	350	800	
06		20	370	260				
07				130	340	180		
08			30	250	320	20		
09		10	250	520	140			
10				20	230	540	550	
11		10	160	270	10			
12					280	260	30	50
13				30	300	620	1,000	
14			140	230				
15		10	160	320	60			
16			20	250	100			
17				60	360	250		
18					180	470	720	
Subtotal	50	100	1,750	3,150	3,150	3,100	3,100	50
Base I Base II	350	900	1,800	2,850	2,850	2,800	2,650	50
Total	400	1,000	3,550	6,000	6,000	5,900	5,750	100

2331

[1]See Figure 2.1-1.

Source: HDR Sciences, with approval of U.S. Air Force, Ballistic Missile Office.

Table 2.1-5. Personnel required for operations, full deployment in Nevada/Utah, 1983-1989.

EMPLOYMENT TYPE	OPERATIONS PERSONNEL					
	1984	1985	1986	1987	1988	1989
First Operating Base						
Officer	100	200	300	400	500	600
Enlisted	950	1,925	2,900	3,850	4,800	5,750
Civilian	200	375	550	750	950	1,150
Subtotal	1,250	2,500	3,750	5,000	6,250	7,500
Second Operating Base						
Officer			100	200	350	450
Enlisted			1,100	2,200	3,250	4,400
Civilian			200	400	650	850
Subtotal			1,400	2,800	4,250	5,700
Total	1,250	2,500	5,150	7,800	10,500	13,200

2168-1

NOTE: Operations employment would continue at 1989 levels throughout the operating life of the project.

TABLE 2.1-6. SHELTER CONSTRUCTION EMPLOYMENT BY CAMPS PER COUNTY

NEVADA/UTAH FULL DEPLOYMENT

COUNTY & CAMP #'S	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO., NEV.	0	0	0	0	0	0	0	0	0	0	0	0	0
SALT LAKE CO., UT	0	0	0	0	0	0	0	0	0	0	0	0	0
MILLARD CO., UT	0	0	550	1800	1350	1500	2700	1050	0	0	0	0	0
(4)													
(5)													
(6)													
BEAVER CO., UT	0	0	200	1350	1650	350	0	0	0	0	0	0	0
(3)													
IRON CO. UT	0	0	0	0	0	0	0	0	0	0	0	0	0
LINCOLN CO., NEV	0	100	950	1650	1950	1700	150	0	0	0	0	0	0
(1)													
(2)													
WHITE PINE CO., NEV	0	0	50	850	2600	650	0	0	0	0	0	0	0
(15)													
(16)													
EUREKA CO., NEV	0	0	0	0	250	2300	2700	950	0	0	0	0	0
(17)													
(18)													
NYE CO., NEV	0	0	400	2600	4950	4100	5300	2050	0	0	0	0	0
(9)													
(10)													
(11)													
(12)													
(13)													
(14)													
JUAB CO., UT	0	0	0	150	1750	2800	750	0	0	0	0	0	0
(7)													
(8)													
WASHINGTON CO., UT	0	0	0	0	0	0	0	0	0	0	0	0	0

SOURCE: HDR, SCIENCES, WITH APPROVAL OF U.S. AIR FORCE, BALLISTIC MISSILE OFFICE.

TABLE 2.1-7. SHELTER ASSEMBLY & CO EMPLOYMENT BY CAMPS PER COUNTY

NEVADA/UTAH FULL DEPLOYMENT

COUNTY & CAMP #'S	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO., NEV.	0	0	0	0	0	0	0	0	0	0	0	0	0
SALT LAKE CO., UT	0	0	0	0	0	0	0	0	0	0	0	0	0
MILLARD CO., UT	0	0	20	370	290	350	730	800	0	0	0	0	0
(4)													
(5)													
(6)													
BEAVER CO., UT	0	0	10	280	360	80	0	0	0	0	0	0	0
(3)													
IRON CO. UT	0	0	0	0	0	0	0	0	0	0	0	0	0
LINCOLN CO., NEV	0	50	40	340	420	400	30	0	0	0	0	0	0
(1)													
(2)													
WHITE PINE CO., NEV	0	0	10	180	570	160	0	0	0	0	0	0	0
(15)													
(16)													
EUREKA CO., NEV	0	0	0	0	60	540	720	720	0	0	0	0	0
(17)													
(18)													
NYE CO., NEV	0	0	20	550	1070	960	1420	1580	50	0	0	0	0
(9)													
(10)													
(11)													
(12)													
(13)													
(14)													
JUAB CO., UT	0	0	0	30	380	660	200	0	0	0	0	0	0
(7)													
(8)													
WASHINGTON CO., UT	0	0	0	0	0	0	0	0	0	0	0	0	0

SOURCE: HDR SCIENCES, WITH APPROVAL OF U.S. AIR FORCE, BALLISTIC MISSILE OFFICE.

Table 2.1-8. Total M-X system personnel requirements, split deployment in Nevada/Utah, 1982-1990.

EMPLOYMENT TYPE	PERSONNEL								
	1982	1983	1984	1985	1986	1987	1988	1989	1990
Construction									
DDA		100	1,900	6,200	6,750	6,350	4,500	1,200	
Base	1,100	1,850	2,400	2,050	1,250				
Subtotal	1,100	1,950	4,300	8,250	8,000	6,350	4,500	1,200	
A&CO									
DDA		50	100	1,350	2,300	1,650	900	950	
Base		250	700	1,350	2,150	2,150	2,100	2,000	50
Subtotal		300	800	2,700	4,450	3,800	3,000	2,950	50
Operations									
Base			1,250	2,450	3,700	4,950	6,250	7,400	7,400
Total	1,100	2,250	6,350	13,400	16,150	15,100	13,750	11,550	7,450

2250-1

Source: HDR Sciences, with approval of U.S. Air Force, Ballistic Missile Office.

Table 2.1-9. Personnel required for construction of DDA facilities and operating base, split deployment in Nevada/Utah, 1982-1990.

CAMP NUMBER[1]	CONSTRUCTION PERSONNEL								
	1982	1983	1984	1985	1986	1987	1988	1989	1990
1		100	1,000	1,500	150				
2					200	950	1,600	500	
3				50	750	1,900	800		
4			50	700	2,150	1,200			
5			350	1,700	650				
6			500	2,000	1,750	300			
7				250	1,100	1,900	500		
8						100	1,600	700	
Subtotal		100	1,900	6,200	6,750	6,350	4,500	1,200	
OB/DDA	1,100	1,850	2,400	2,050	1,250				
Total	1,100	1,950	4,300	8,250	8,000	6,350	4,500	1,200	

[1]See Figure 2.1-2.

2551-1

Source: HDR Sciences, with approval of U.S. Air Force, Ballistic Missile Office.

Table 2.1-10. Personnel required for assembly and checkout operations, split deployment in Nevada/Utah, 1982-1990.

CAMP NUMBER[1] AND EMPLOY-MENT TYPE	A & CO AND OPERATIONS PERSONNEL								
	1982	1983	1984	1985	1986	1987	1988	1989	1990
1		50	50	400	200	50			
2						100	350	450	
3					300	450	200	50	
4				200	600	350			
5				400	250	100			
6			50	250	600	200			
7				100	350	400	150		
8							200	450	
Subtotal		50	100	1,350	2,300	1,650	900	950	
OB/DAA		250	700	1,350	2,150	2,150	2,100	2,000	50
Total		300	800	2,700	4,450	3,800	3,000	2,950	50
Operations									
Officer			100	200	300	400	500	600	600
Enlisted			950	1,900	2,850	3,800	4,800	5,700	5,700
Civilian			200	350	550	750	950	1,100	1,100
Total			1,250	2,450	3,700	4,950	6,250	7,400	7,400

2552

[1]See Figure 2.1-2.

Source: HDR Sciences; U.S. Air Force, Ballistic Missile Office; and Strategic Air Command.

TABLE 2.1-11. SHELTER CONSTRUCTION EMPLOYMENT BY CAMPS PER COUNTY

NEVADA/UTAH SPLIT DEPLOYMENT

COUNTY & CAMP #'S	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO ,NEV	0	0	0	0	0	0	0	0	0	0	0	0	0
SALT LAKE CO ,UT	0	0	0	0	0	0	0	0	0	0	0	0	0
MILLARD CO ,UT	0	0	400	2400	2800	1200	0	0	0	0	0	0	0
(4)													
(5)													
BEAVER CO ,UT	0	0	0	50	750	1700	800	0	0	0	0	0	0
(3)													
IRON CO UT	0	0	0	0	0	0	0	0	0	0	0	0	0
LINCOLN CO ,NEV	0	100	1000	1500	350	750	1600	500	0	0	0	0	0
(1)													
(2)													
WHITE PINE CO ,NEV	0	0	0	0	0	0	0	0	0	0	0	0	0
EUREKA CO ,NEV	0	0	0	0	0	0	0	0	0	0	0	0	0
NYE CO ,NEV	0	0	500	2250	2850	2300	2100	700	0	0	0	0	0
(6)													
(7)													
(8)													
JUAB CO ,UT	0	0	0	0	0	0	0	0	0	0	0	0	0
WASHINGTON CO ,UT	0	0	0	0	0	0	0	0	0	0	0	0	0

SOURCE: HDR SCIENCES, WITH APPROVAL OF U.S. AIR FORCE, BALLISTIC MISSILE OFFICE.

TABLE 2.1-12. SHELTER ASSEMBLY & CO EMPLOYMENT BY CAMPS PER COUNTY

NEVADA/UTAH SPLIT DEPLOYMENT

COUNTY & CAMP #'S	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO ,NEV	0	0	0	0	0	0	0	0	0	0	0	0	0
SALT LAKE CO ,UT	0	0	0	0	0	0	0	0	0	0	0	0	0
MILLARD CO ,UT	0	0	0	600	850	450	0	0	0	0	0	0	0
(4)													
(5)													
BEAVER CO ,UT	0	0	0	0	300	450	200	50	0	0	0	0	0
(3)													
IRON CO UT	0	0	0	0	0	0	0	0	0	0	0	0	0
LINCOLN CO ,NEV	0	50	50	400	200	150	350	450	0	0	0	0	0
(1)													
(2)													
WHITE PINE CO ,NEV	0	0	0	0	0	0	0	0	0	0	0	0	0
EUREKA CO ,NEV	0	0	0	0	0	0	0	0	0	0	0	0	0
NYE CO ,NEV	0	0	50	350	950	600	350	450	0	0	0	0	0
(6)													
(7)													
(8)													
JUAB CO ,UT	0	0	0	0	0	0	0	0	0	0	0	0	0
WASHINGTON CO ,UT	0	0	0	0	0	0	0	0	0	0	0	0	0

SOURCE: HDR SCIENCES, WITH APPROVAL OF U.S. AIR FORCE, BALLISTIC MISSILE OFFICE.

Table 2.1-13. Total M-X system personnel requirements, full deployment in Texas/New Mexico, 1982-1991.

EMPLOYMENT TYPE	PERSONNEL									
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Construction										
DDA		950	2,600	8,100	12,050	13,900	11,750	3,600		
Base I[2]	1,150	1,900	2,400	2,000	1,200					
Base II[3]				200	1,350	2,050	1,450	750		
Subtotal	1,150	2,850	5,000	10,300	14,600	15,950	13,200	4,350		
A & CO										
DDA		50	100	1,750	3,150	3,150	3,100	3,100	50	
Base I[2]		350	900	1,800	2,850	2,850	2,800	2,650	50	
Base II[3]										
Subtotal		400	1,000	3,550	6,000	6,000	5,900	5,750	100	
Operations										
Base I[2]			1,250	2,500	3,750	5,000	6,150	7,500	7,500	7,500
Base II[3]					1,400	2,800	4,250	5,700	5,700	5,700
Subtotal			1,250	2,500	5,150	7,800	10,400	13,200	13,200	13,200
Total	1,150	3,250	7,250	16,350	25,750	29,750	29,500	23,300	13,300	13,200

2170

[1]DDA includes PS, ASC, DTN, CMF, RSS, and CR.

[2]Base I includes DAA, OBTS, and airfield. The possibility of using the existing airfield at Clovis exists, but was not considered for this analysis.

[3]Base II includes an airfield.

Source: HDR Sciences, with approval of U.S. Air Force, Ballistic Missile Office.

Table 2.1-14. Personnel required for construction of DDA facilities and operating bases, full deployment in Texas/New Mexico, 1982-1989.

CAMP NUMBER	CONSTRUCTION PERSONNEL							
	1982	1983	1984	1985	1986	1987	1988	1989
01			200	1,350	1,950	400		
02			250	1,350	1,400	550		
03				600	850	1,850	850	
04					50	1,200	2,300	400
05		950	2,000	2,000	200			
06			150	1,150	1,000			
07				200	1,250	700		
08					850	1,500	50	
09					50	750	1,850	650
10						500	1,350	800
11				1,200	2,150	1,050		
12				200	1,450	2,200	500	
13				50	800	1,500	1,650	250
14					50	800	1,250	50
15						900	1,950	1,450
Subtotal		950	2,600	8,100	12,050	13,900	11,750	3,600
Base I	1,150	1,900	2,400	2,000	1,200			
Base II				200	1,350	2,050	1,450	750
Total	1,150	2,850	5,000	10,300	14,600	15,950	13,200	4,350

2171

[1]See Figure 2.1-3.

Source: HDR Sciences, with approval of U.S. Air Force, Ballistic Missile Office.

Table 2.1-15. Personnel required for assembly and checkout of DDA facilities and operating bases, full deployment in Texas/New Mexico, 1982-1990.

CAMP NUMBER[1]	ASSEMBLY AND CHECKOUT							
	1983	1984	1985	1986	1987	1988	1989	1990
01			250	800	150			
02			350	400	300			
03				300	350	350	100	
04					150	300	600	
05	50	100	800	350				
06			250	300				
07				300	300			
08					400	250		
09					150	300	500	
10						200	500	
11			100	450	450	100		
12				250	400	450	100	
13					500	400	300	
14						250	250	
15						500	750	50
Subtotal	50	100	1,750	3,150	3,150	3,100	3,100	50
Base I Base II	350	900	1,800	2,850	2,850	2,800	2,650	50
Total	400	1,000	3,550	6,000	6,000	5,900	5,750	100

2172

[1]See Figure 2.1-3.

Source: HDR Sciences, with approval of U.S. Air Force, Ballistic Missile Office.

Table 2.1-16. Personnel required for operations, full deployment in Texas/New Mexico, 1983-1989.

EMPLOYMENT TYPE	OPERATIONS PERSONNEL					
	1984	1985	1986	1987	1988	1989
Base I						
Officer	100	200	300	400	500	600
Enlisted	950	1,925	2,900	3,850	4,800	5,750
Civilian	200	375	550	750	950	1,150
Subtotal	1,250	2,500	3,750	5,000	6,250	7,500
Base II						
Officer			100	200	350	450
Enlisted			1,100	2,200	3,250	4,400
Civilian			200	400	650	850
Subtotal			1,400	2,800	4,250	5,700
Total	1,250	2,500	5,150	7,800	10,500	13,200

2173

Sources: U.S. Air Force, Ballistic Missile Office and Strategic Air Command.

TABLE 2.1 17. SHELTER CONSTRUCTION EMPLOYMENT BY CAMPS PER COUNTY

TEXAS/NEW MEXICO FULL DEPLOYMENT

COUNTY & CAMP #'S	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
TEXAS													
DALLAM CO	0	0	0	50	850	3200	4850	1750	0	0	0	0	0
(13)													
(14)													
(15)													
HARTLEY CO	0	0	0	1200	2150	1050	0	0	0	0	0	0	0
(11)													
SHERMAN CO	0	0	0	0	0	0	0	0	0	0	0	0	0
MOORE CO	0	0	0	0	0	0	0	0	0	0	0	0	0
POTTER/RANDALL CO S	0	0	0	0	850	1500	50	0	0	0	0	0	0
(8)													
DEAF SMITH CO	0	0	0	0	50	1250	3200	1450	0	0	0	0	0
(9)													
(10)													
SWISHER CO	0	0	0	0	0	0	0	0	0	0	0	0	0
PARMER CO	0	0	150	1350	2250	700	0	0	0	0	0	0	0
(6)													
(7)													
BAILEY CO	0	0	0	600	850	1850	850	0	0	0	0	0	0
(3)													
LAMB CO	0	0	0	0	0	0	0	0	0	0	0	0	0
LUBBOCK CO	0	0	0	0	0	0	0	0	0	0	0	0	0
HALE CO	0	0	0	0	0	0	0	0	0	0	0	0	0
HOCKLEY CO	0	0	0	0	0	0	0	0	0	0	0	0	0
COCHRAN CO	0	0	0	0	0	0	0	0	0	0	0	0	0
OLDHAM CO	0	0	0	0	0	0	0	0	0	0	0	0	0
CASTRO CO	0	0	0	0	0	0	0	0	0	0	0	0	0
NEW MEXICO													
QUAY CO	0	950	2000	2000	200	0	0	0	0	0	0	0	0
(5)													
CURRY CO	0	0	0	0	0	0	0	0	0	0	0	0	0
DEBACA CO	0	0	0	0	0	0	0	0	0	0	0	0	0
ROOSEVELT CO	0	0	250	1350	1450	1750	2300	400	0	0	0	0	0
(2)													
(4)													
CHAVES CO	0	0	200	1350	1950	400	0	0	0	0	0	0	0
(1)													
UNION CO	0	0	0	0	0	0	0	0	0	0	0	0	0
HARDING CO	0	0	0	200	1450	2200	500	0	0	0	0	0	0
(12)													

SOURCE: HDR SCIENCES, WITH APPROVAL OF U.S. AIR FORCE, BALLISTIC MISSILE OFFICE.

TABLE 2.1-18. SHELTER ASSEMBLY & CO EMPLOYMENT BY CAMPS PER COUNTY

TEXAS/NEW MEXICO FULL DEPLOYMENT

COUNTY & CAMP #'S	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
TEXAS													
DALLAM CO	0	0	0	0	0	500	1150	1300	50	0	0	0	0
(13)													
(14)													
(15)													
HARTLEY CO	0	0	0	100	450	450	100	0	0	0	0	0	0
(11)													
SHERMAN CO	0	0	0	0	0	0	0	0	0	0	0	0	0
MOORE CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
POTTER/RANDALL CO.S	0	0	0	0	0	400	250	0	0	0	0	0	0
(8)													
DEAF SMITH CO.	0	0	0	0	0	150	500	1000	0	0	0	0	0
(9)													
(10)													
SWISHER CO	0	0	0	0	0	0	0	0	0	0	0	0	0
PARMER CO	0	0	0	250	600	300	0	0	0	0	0	0	0
(6)													
(7)													
BAILEY CO	0	0	0	0	300	350	350	100	0	0	0	0	0
(3)													
LAMB CO	0	0	0	0	0	0	0	0	0	0	0	0	0
LUBBOCK CO	0	0	0	0	0	0	0	0	0	0	0	0	0
HALE CO	0	0	0	0	0	0	0	0	0	0	0	0	0
HOCKLEY CO	0	0	0	0	0	0	0	0	0	0	0	0	0
COCHRAN CO	0	0	0	0	0	0	0	0	0	0	0	0	0
OLDHAM CO	0	0	0	0	0	0	0	0	0	0	0	0	0
CASTRO CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
NEW MEXICO													
QUAY CO	0	50	150	800	350	0	0	0	0	0	0	0	0
(5)													
CURRY CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
DEBACA CO	0	0	0	0	0	0	0	0	0	0	0	0	0
ROOSEVELT CO	0	0	0	350	400	450	300	600	0	0	0	0	0
(2)													
(4)													
CHAVES CO.	0	0	0	250	800	150	0	0	0	0	0	0	0
(1)													
UNION CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
HARDING CO	0	0	0	0	250	400	450	100	0	0	0	0	0
(12)													

SOURCE: HDR SCIENCES, WITH APPROVAL OF U.S. AIR FORCE, BALLISTIC MISSILE OFFICE.

Table 2.1-19. Total direct personnel requirements, split deployment in Texas/New Mexico, 1982-1990.

EMPLOYMENT TYPE	PERSONNEL								
	1982	1983	1984	1985	1986	1987	1988	1989	1990
Construction									
DDA			100	1,950	6,700	8,150	6,800	2,650	
Base		300	1,850	2,400	2,000	1,200			
Subtotal		300	1,950	4,350	8,700	9,350	6,800	2,650	
A&CO									
DDA				400	850	1,500	2,200	2,150	50
Base		250	700	1,350	2,150	2,150	2,100	2,000	50
Subtotal		250	700	1,750	3,000	3,650	4,300	4,150	100
Operations									
Base				1,250	2,400	3,700	4,850	6,050	6,050
Total		550	2,650	7,350	14,150	16,700	15,950	12,850	6,150

3565

Source: HDR Sciences, with approval of U.S. Air Force, Ballistic Missile Office.

Table 2.1-20. Personnel required for construction of DDA facilities and operating base, split deployment in Texas/New Mexico, 1982-1990.

CAMP NUMBER[1]	CONSTRUCTION								
	1982	1983	1984	1985	1986	1987	1988	1989	1990
1			100	1,200	1,950				
2				450	1,850	1,750			
3					700	2,000	1,500		
4						450	2,100	1,250	
5				300	1,900	1,900			
6					350	1,950	1,500		
7						100	1,700	1,400	
Subtotal			100	1,950	6,750	8,150	6,800	2,650	
OB/DAA		300	1,850	2,400	2,000	1,200			
Total		300	1,950	4,350	8,750	9,350	6,800	2,650	

3566-1

[1] See Figure 2.1-4.

Source: HDR Sciences, with approval of U.S. Air Force, Ballistic Missile Office.

Table 2.1-21. Personnel required for assembly and checkout and operations, split deployment in Texas/New Mexico, 1982-1990.

CAMP NUMBER AND EMPLOYMENT TYPE[1]	A & CO AND OPERATIONS PERSONNEL								
	1982	1983	1984	1985	1986	1987	1988	1989	1990
1				400	460				
2					190	580	300		
3						170	500	400	
4							370	700	
5					200	580	370		
6						170	500	400	
7							160	650	50
Subtotal				400	850	1,500	2,200	2,150	50
OB/DAA		250	700	1,350	2,150	2,150	2,100	2,000	50
Total A & CO		250	700	1,750	3,000	3,650	4,300	4,150	100
Operations									
Officer				100	200	300	400	500	500
Enlisted				950	1,850	2,850	3,700	4,650	4,650
Civilian				200	350	550	750	900	900
Total Operations				1,250	2,400	3,700	4,850	6,050	6,050

3567-1

[1]See Figure 2.1-4.

Sources: HDR Sciences; U.S. Air Force, Ballistic Missile Office; and Strategic Air Command.

TABLE 2.1-22 SHELTER CONSTRUCTION EMPLOYMENT BY CAMPS PER COUNTY

TEXAS/NEW MEXICO SPLIT DEPLOYMENT

COUNTY & CAMP #'S	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
TEXAS													
DALLAM CO. (7)	0	0	0	0	0	100	1700	1400	0	0	0	0	0
HARTLEY CO. (6)	0	0	0	0	350	1950	1500	0	0	0	0	0	0
SHERMAN CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
MOORE CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
POTTER/RANDALL CO. S	0	0	0	0	0	0	0	0	0	0	0	0	0
DEAF SMITH CO. (1)	0	0	100	1200	1950	0	0	0	0	0	0	0	0
SWISHER CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
PARMER CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
BAILEY CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
LAMB CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
LUBBOCK CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
HALE CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
HOCKLEY CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
COCHRAN CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
OLDHAM CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
CASTRO CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
NEW MEXICO													
QUAY CO. (2)	0	0	0	450	1850	1750	0	0	0	0	0	0	0
CURRY CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
DEBACA CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
ROOSEVELT CO. (3)	0	0	0	0	700	2000	1500	0	0	0	0	0	0
CHAVES CO. (4)	0	0	0	0	0	450	2100	1250	0	0	0	0	0
UNION CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
HARDING CO. (5)	0	0	0	300	1900	1900	0	0	0	0	0	0	0

SOURCE: HDR SCIENCES, WITH APPROVAL OF U.S. AIR FORCE, BALLISTIC MISSILE OFFICE.

TABLE 2.1-23 SHELTER ASSEMBLY & CO EMPLOYMENT BY CAMPS PER COUNTY

TEXAS/NEW MEXICO SPLIT DEPLOYMENT

COUNTY & CAMP #'S	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
TEXAS													
DALLAM CO. (7)	0	0	0	0	0	0	160	650	50	0	0	0	0
HARTLEY CO. (6)	0	0	0	0	0	170	500	400	0	0	0	0	0
SHERMAN CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
MOORE CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
POTTER/RANDALL CO.S	0	0	0	0	0	0	0	0	0	0	0	0	0
DEAF SMITH CO. (1)	0	0	0	400	460	0	0	0	0	0	0	0	0
SWISHER CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
PARMER CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
BAILEY CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
LAMB CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
LUBBOCK CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
HALE CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
HOCKLEY CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
COCHRAN CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
OLDHAM CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
CASTRO CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
NEW MEXICO													
QUAY CO. (2)	0	0	0	0	190	580	300	0	0	0	0	0	0
CURRY CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
DEBACA CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
ROOSEVELT CO. (3)	0	0	0	0	0	170	500	400	0	0	0	0	0
CHAVES CO. (4)	0	0	0	0	0	0	370	700	0	0	0	0	0
UNION CO.	0	0	0	0	0	0	0	0	0	0	0	0	0
HARDING CO. (5)	0	0	0	0	200	580	370	0	0	0	0	0	0

SOURCE: HDR SCIENCES, WITH APPROVAL OF U.S. AIR FORCE, BALLISTIC MISSILE OFFICE.

would start in 1982, with most employment initially concentrated in construction trades. M-X construction employment is projected to peak at more than 17,000 workers in 1986. Direct project employment in all categories - construction, assembly and checkout, and operations - is expected to surpass 28,000 jobs from 1986 through 1988. Direct M-X employment would diminish rapidly thereafter, reaching a long-term level of 13,200 in 1991 which would continue as long as the system remains in operation (see Table 2.1-2).

Construction camps dispersed throughout the ROI would represent points of employment for personnel engaged in construction and assembly and checkout of the Designated Deployment Area (DDA) facilities (Figure 2.1-1). Table 2.1-3 presents construction personnel estimates by camp location, while Table 2.1-4 details requirements for assembly and checkout workers. The regional distribution of employment shown in these tables is critical since these construction camps would be employment centers for more than 17,600 persons at the peak of DDA construction and assembly and checkout activity (1986). A total of 18 camps would be distributed over the region, with activity at each camp for a three-to-four-year period between 1983 and 1990. As many as 3,000 workers could be based in a camp in the peak year of its activity, as occurs with camp 9 in 1986. These tables indicate that just as employment growth is projected to be very rapid, decline of employment (construction jobs particularly) would also occur rapidly, leaving little time for regional adjustment.

The larger of the two operating bases would directly create jobs for up to 4,700 construction and assembly and checkout workers (see Table 2.1-2) and 7,500 operations personnel (including military). Construction of the base would begin in 1982, employing 1,500 construction and assembly and checkout workers. Operations would begin at this site with 1,250 persons in 1984, with a gradual build-up of operating staff until the full complement of 7,500 workers is reached in 1989. Table 2.1-5 indicates that of this long-run total, 85 percent would be military personnel.

The second operating base would employ up to 2,000 construction workers and 5,700 operations personnel (again including military). Construction of this second base would start in 1985. The base would begin operations in 1986, with 1,400 employees, and, like the larger base, reach its full complement of personnel by 1989. The combined base staffing level is expected to equal 13,200 persons. Activity would continue at these bases throughout the operating life of the system.

2.2 REGIONS OF INFLUENCE

The areas subjected to detailed analysis in this study are illustrated in Figures 2.2-1 and 2.2-2. These areas have been defined to include the locations of much of the economic activity resulting from the project. They also include those areas where impacts potentially would be large compared to the level of economic activity without the project. The regions of influence contain the places of employment of all construction, assembly and checkout, and operations personnel identified in section 2.1.

Both the Nevada/Utah and Texas/New Mexico regions include large urban places on the fringes of the rural deployment areas themselves. These metropolitan areas potentially would experience significant indirect employment growth as a result of the project, and consequently are included in the regions of influence.

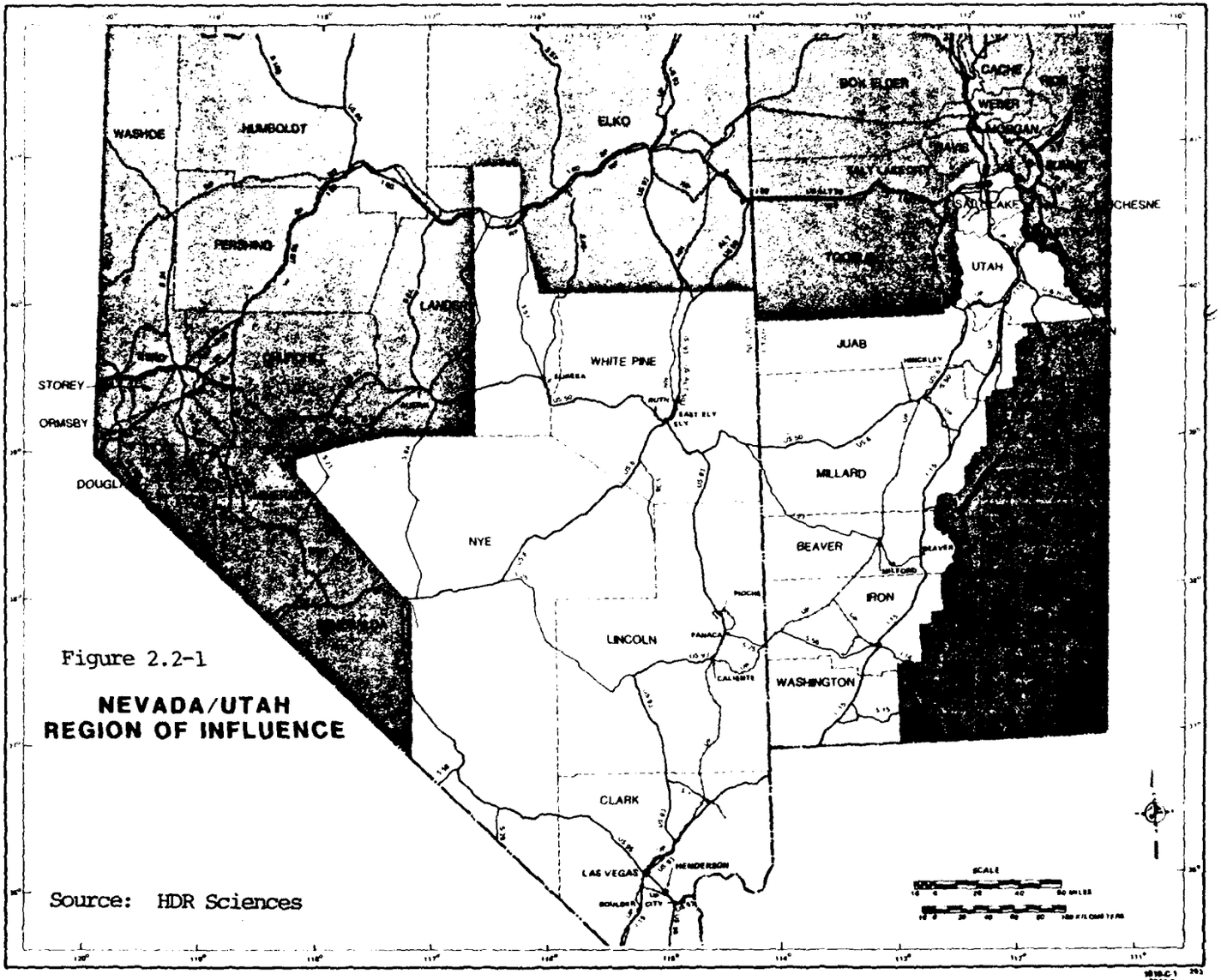

Figure 2.2-1

NEVADA/UTAH REGION OF INFLUENCE

Source: HDR Sciences

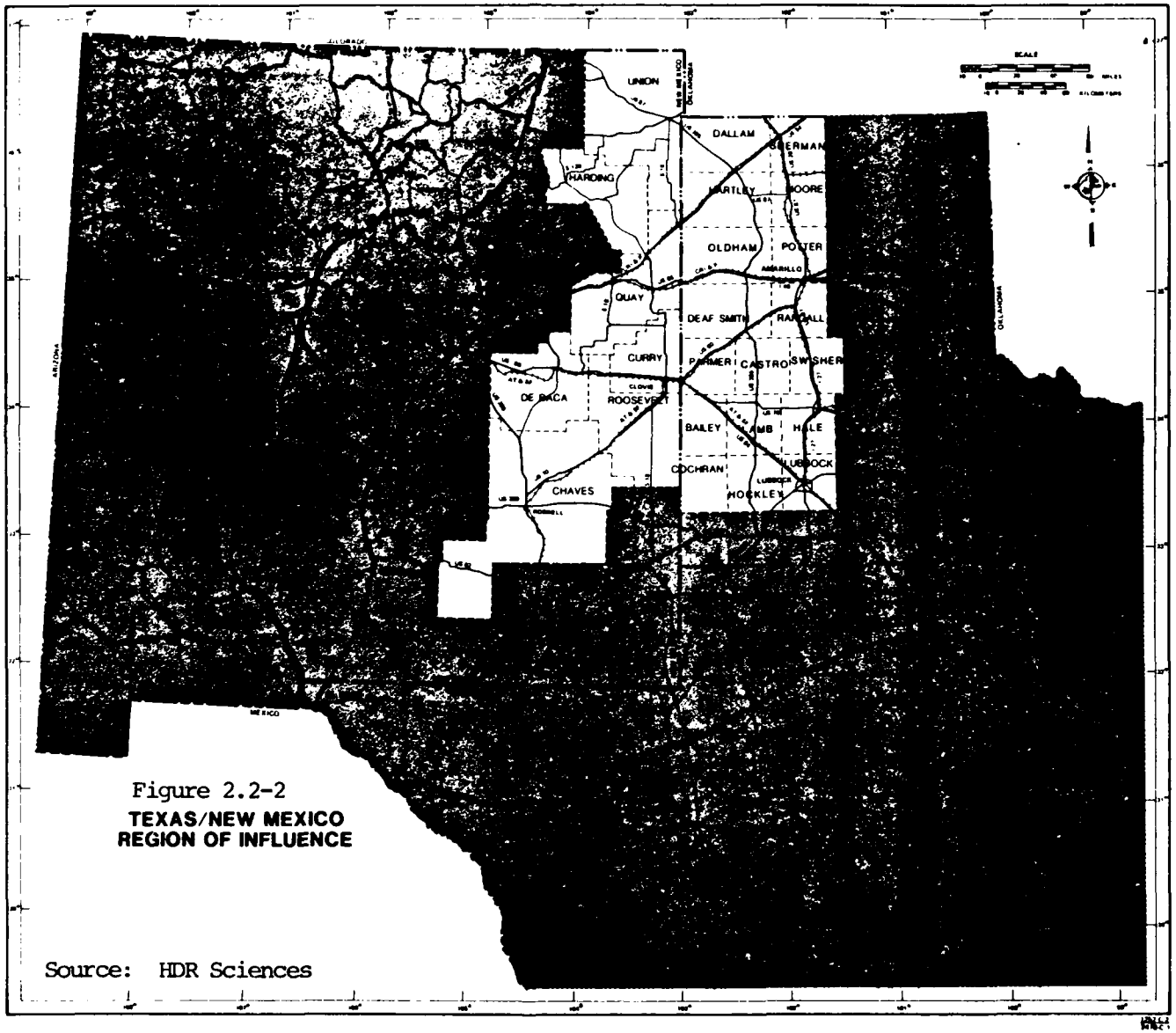

Figure 2.2-2
TEXAS/NEW MEXICO REGION OF INFLUENCE

Source: HDR Sciences

There is no unequivocal standard for including or excluding counties from the formally defined regions of influence. The economic effects of the project disperse over a broad area in a continuous - though uneven - fashion. M-X - induced changes in employment, sales, earnings, and population do not begin and end suddenly at county boundaries. Using the county as the basic regional unit of analysis, while necessary because of data limitations, produces a somewhat imperfect fit to reality. This qualification is important in interpreting the results of the analysis.

Both regions of influence have been defined as contiguous areas surrounding the deployment sites. This again is only an approximation to reality. For example, the Reno, Nevada, SMSA has been excluded from the region of influence, as have Los Angeles and San Francisco. Some indirect employment and other economic effects would no doubt occur in these areas, though the level of this indirect activity would be quite small compared to the economies of these metropolitan centers. Dallas - Fort Worth, El Paso, Oklahoma City, and Albuquerque likewise have been excluded from the Texas/New Mexico region of influence, despite the possibility of limited secondary impacts in these SMSAs. The "leakage" of expenditures from the ROI to these areas has been taken into account in this analysis.

2.3 PAYROLL AND INCOME TRANSFER ASSUMPTIONS

Table 2.3-1 displays the earnings-per-worker assumptions used in the M-X economic impact analysis. Appendix A contains, for purposes of comparison, payroll data for existing Minuteman bases.

Average annual earnings estimates for construction workers are based on a telephone survey of trade union halls, which yielded an average for all crafts required of $33,600 (fiscal year 1980 dollars). In addition, subsistence payments of $21 per day (also FY1980 dollars) probably would be required (see Ralph M. Parsons data, Appendix B). This subsistence allowance would raise gross construction-worker earnings to $39,000 per year, as shown in the table.

Tables 2.3-2 and 2.3-3 display the assumptions used in this analysis regarding tax, savings, and other income transfer behavior for the individuals on project payrolls. Slightly different parameter values were used for the Texas/New Mexico alternatives than for Nevada/Utah. These variations reflect differences in state income tax rates and income export propensities between the two deployment regions. The Utah state income tax is higher than that for New Mexico, while neither Texas nor Nevada have state income taxes. All tax rates shown are effective rates, and make allowances for average deductions and exemptions. The income tax rates shown are progressive, reflecting the general structure of federal and state income taxes.

Because the Texas/New Mexico region is more accessible from major population centers than is Nevada/Utah, the incomes of construction and assembly and checkout workers are likely to be spent over a broader area. Much of this income would be spent outside the ROI. This is taken into account in the analysis by distributing the project's effects on consumption final demand over a large region. The income export propensities for Texas/New Mexico consequently are smaller than they are for the Nevada/Utah region, where the broader regional distribution remains implicit rather than explicit. These export propensities include probable expenditures at the base commissary and exchange, since these outlays represent transfers out of the local economy. Local commissary and exchange procurement is treated separately (see section 2.5).

Table 2.3-1. Earnings-per-worker assumptions for M-X economic impact analysis.

EMPLOYMENT TYPE	EARNINGS ASSUMPTION FISCAL YEAR 1980 DOLLARS
Construction workers[1]	39,000
Assembly and checkout workers	25,000
Officers	25,800
Enlisted personnel	11,400
Civilian operations personnel	19,700
Indirect civilian employees	13,000

2340

[1]Assumes 40-hour week and is based on an average of trades required. It also includes $5,400 subsistence allowance.

Sources:
- Construction - Telephone interviews with trade union personnel in Nevada and Utah.
- A & CO - U.S. Air Force, Ballistic Missile Office.
- Operations (Officers, enlisted personnel, and civilians) - U.S. Air Force, Ballistic Missile Office.
- Indirect - U.S. Department of commerce, Bureau of Economic Analysis, Regional Economic Information System.

Table 2.3-2. Tax, savings, and income transfer assumptions for Nevada/Utah deployment region (in percent).

EMPLOYMENT TYPE	FEDERAL INCOME TAX RATE	UTAH STATE INCOME TAX RATE[1]	PERSONAL SAVINGS RATE	SOCIAL SECURITY TAX RATE	FEDERAL RETIREMENT CONTRIBUTION	INCOME EXPORT PROPENSITY
Construction Workers	20.0	6.0	7.0	6.0	—	15.0
Assembly and Checkout Workers	15.0	5.4	5.0	6.0	—	15.0
Officers	15.0	2.0	5.0	6.0	—	25.0
Enlisted Personnel	10.0	2.0	3.0	6.0	—	30.0
Civilian Operations Personnel	15.0	5.4	5.0	—	7.0	15.0

2972-1

NOTE: All tax rates shown are effective rates, and include allowances for deductions and exemptions.

[1]Rates shown for officers and enlisted personnel represent averages for states where military personnel claim residence.

Source: HDR Sciences, 1980.

Table 2.3-3. Tax, savings, and income transfer assumptions for Texas/New Mexico deployment region (in percent).

EMPLOYMENT TYPE	FEDERAL INCOME TAX RATE	NEW MEXICO STATE INCOME TAX RATE [1]	PERSONAL SAVINGS RATE	SOCIAL SECURITY TAX RATE	FEDERAL RETIREMENT CONTRIBUTION	INCOME EXPORT PROPENSITY
Construction Workers	20.0	2.8	7.0	6.0	—	10.0
Assembly and Checkout Workers	15.0	1.9	5.0	6.0	—	10.0
Officers	15.0	2.0	5.0	6.0	—	25.0
Enlisted Personnel	10.0	2.0	3.0	6.0	—	30.0
Civilian Operations Personnel	15.0	1.9	5.0	—	7.0	15.0

2972-2

NOTE: All tax rates shown are effective rates, and include allowance for deducations and exemptions.

[1] Rates shown for officers and enlisted personnel represent averages for states where military personnel claim residence.

Source: HDR Sciences, 1980.

2.4 REGIONAL DISTRIBUTION OF PAYROLL CONSUMPTION EXPENDITURES

Project data on employment, assumptions regarding worker earnings and income transfers, and gravity-type estimates of interaction-potential matrices jointly determine the regional distribution of personal consumption expenditures associated with M-X payrolls.

The interaction-potential matrices used in analyzing camp payroll expenditures are presented here as Tables 2.4-1 through 2.4-4. All the Nevada/Utah full deployment alternatives use the coefficients presented in Table 2.4-1 because the camp locations are identical for these alternatives. These matrices provide the basis for allocating the regionally disposable income originating at each camp in each year to the communities and counties across a broad region. They effectively convert income earned at a single point into consumption demands spread broadly over a much larger area. The matrices provide the linkage which ties the individual county interindustry models together.

The camp payroll attractivity matrices are estimated using a standard gravity-model formulation with population of each community as the numerator and the square of the distance from each camp to each community as the denominator. The population data used are the most recent historical information available, including 1978 and 1979 estimates provided by the states and local governments. The distance data are measured as road distances as shown in Rand McNally's Road Atlas of the United States.

Tables 2.4-5 and 2.4-6 display the sub-regional allocation matrices used in association with payrolls earned at the base locations. These allocation assumptions apply to construction, assembly and checkout, and operations earnings at the base sites. These matrices are based on informed judgment, taking into account both distance to and attractive potential of the communities near the possible base sites.

Tables 2.4-7 through 2.4-10 display the estimated distribution of camp payroll consumption expenditures for each of the alternatives considered in this analysis. Tables 2.4-11 through 2.4-20 present the estimated distribution of base payroll expenditures for the Proposed Action and all alternatives.

In summary, the level of consumption expenditures projected for each county in a particular year varies directly with the size of that community and the level of employment at each site of project activity. Consumption expenditures allocated to a given county vary inversely with the square of the distance between the county and points of project activity.

2.5 M-X PROCUREMENT DEMANDS

The local procurement demands of the M-X system are of three general types: construction materials, construction work-force support, and operations work-force support. Data on M-X procurement needs are incomplete and this analysis consequently relies on estimates derived from other military bases and preliminary contractor plans. These data deficiencies are unfortunate but do not appear to be critical, since procurement is likely to be a much smaller source of local economic stimulus than project payroll outlays.

TABLE 2.4-1. COMMUNITY SHARES IN CONSTRUCTION CAMP PAYROLL EXPENDITURES: FULL DEPLOYMENT IN NEVADA/UTAH.

(PERCENT)

COMMUNITY	CONSTRUCTION CAMP NUMBER																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
CLARK CO., NEV. (LAS VEGAS)	37.10	63.40	21.60	15.10	12.80	9.50	9.40	3.30	62.40	61.20	45.20	32.90	26.20	27.00	17.80	14.10	19.80	19.80
WASHOE CO., NEV (RENO)	42.10	2.60	3.30	3.00	4.20	1.90	2.40	0.80	7.70	6.80	9.10	11.10	10.80	7.00	6.60	16.90	20.70	23.60
SALT LAKE CO., UT																		
SALT LAKE CITY	11.00	20.70	44.10	52.80	58.60	60.00	66.30	86.10	20.80	20.40	31.20	22.20	15.70	41.50	32.30	42.10	40.50	36.80
PROVO	1.45	3.19	7.29	9.44	9.69	12.40	10.70	5.12	2.51	2.16	3.81	2.68	1.66	3.96	4.35	4.02	5.21	4.73
MILLARD CO., UT																		
LYNNDYL	0.02	0.04	0.16	0.22	0.25	0.66	0.26	0.23	0.03	0.03	0.05	0.03	0.02	0.05	0.05	0.05	0.05	0.05
DELTA	0.12	0.31	0.68	2.17	2.06	8.16	2.95	1.70	0.16	0.17	0.28	0.22	0.13	0.33	0.34	0.36	0.32	0.33
FILLMORE	0.14	0.21	0.60	1.56	1.22	1.15	0.76	0.45	0.16	0.14	0.22	0.16	0.09	0.39	0.26	0.39	0.27	0.26
BEAVER CO., UT (MILFORD)	0.38	0.41	4.39	3.95	1.66	0.83	0.92	0.34	0.39	0.33	0.32	0.25	0.17	0.68	0.49	0.69	0.49	0.44
IRON CO., UT																		
BERYL	0.04	0.03	0.15	0.04	0.02	0.01	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
CEDAR CITY	2.16	1.91	10.70	5.40	2.04	1.44	1.77	0.68	1.48	2.23	1.40	1.11	0.77	1.27	1.10	1.29	1.07	1.03
LINCOLN CO., NEV (CALIENTE)	3.34	0.05	1.41	0.68	0.57	0.22	0.23	0.08	0.88	1.35	0.86	0.53	0.23	0.41	0.43	0.42	0.41	0.37
WHITE PINE CO., NEV (ELY)	0.83	4.33	2.44	3.42	4.66	1.43	2.39	0.43	1.10	1.92	0.55	2.09	0.95	12.90	34.10	13.10	6.12	5.55
EUREKA CO., NEV (EUREKA)	0.02	0.06	0.05	0.05	0.08	0.03	0.04	0.01	0.03	0.04	0.08	0.09	0.07	0.15	0.79	4.85	2.15	1.95
LANDER CO., NEV (AUSTIN)	0.01	0.03	0.02	0.03	0.05	0.02	0.02	0.61	0.05	0.06	0.19	0.16	0.12	0.08	0.15	0.44	0.84	3.05
NYE CO., NEV (TONOPAH)	0.21	0.13	0.14	0.15	0.22	0.10	0.12	0.03	1.10	2.12	5.53	25.60	42.60	1.25	0.28	0.39	0.98	1.11
JUAB CO., UT																		
EUREKA	0.02	0.06	0.15	0.19	0.20	0.36	0.27	0.12	0.04	0.03	0.06	0.04	0.03	0.07	0.08	0.07	0.07	0.08
NEPHI	0.09	0.21	0.53	0.67	0.83	1.28	0.84	0.42	0.15	0.12	0.22	0.15	0.08	0.24	0.28	0.24	0.31	0.28
WASHINGTON CO., UT (ST. GEORGE)	0.85	2.24	2.25	1.14	0.75	0.46	0.44	0.30	1.02	0.79	1.01	0.65	0.38	0.56	0.60	0.57	0.66	0.67

SOURCE: HDR SCIENCES, BASED ON A GRAVITY-MODEL FORMULATION USING POPULATION AND DISTANCE SQUARED.

TABLE 2.4-2. COMMUNITY SHARES IN CONSTRUCTION CAMP PAYROLL EXPENDITURES; SPLIT DEPLOYMENT IN NEVADA/UTAH

(PERCENT)

COMMUNITY	CONSTRUCTION CAMP NUMBER							
	1	2	3	4	5	6	7	8
CLARK CO., NEV. (LAS VEGAS)	37.10	63.40	21.60	15.10	9.50	62.40	61.20	45.20
WASHOE CO., NEV (RENO)	42.10	2.60	3.30	3.00	1.90	7.70	6.80	9.10
SALT LAKE CO., UT								
SALT LAKE CITY	11.00	20.70	44.10	52.80	60.00	20.80	20.40	31.20
PROVO	1.50	3.20	7.30	9.40	12.40	2.50	2.20	3.80
MILLARD CO., UT								
LYNNDYL	0.00	0.00	0.20	0.20	0.70	0.00	0.00	0.00
DELTA	0.10	0.80	0.70	2.20	8.20	0.20	0.20	0.30
FILLMORE	0.10	0.20	0.60	1.60	1.20	0.20	0.10	0.20
BEAVER CO., UT (MILFORD)	0.40	0.40	4.40	3.90	0.80	0.30	0.30	0.30
IRON CO., UT								
BERYL	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00
CEDAR CITY	2.20	1.90	10.70	5.40	1.40	1.50	2.20	1.40
LINCOLN CO., NEV (CALIENTE)	3.30	0.00	1.40	0.70	0.20	0.90	1.30	0.90
WHITE PINE CO., NEV (ELY)	0.80	4.30	2.40	3.40	1.40	1.10	1.90	0.60
EUREKA CO., NEV (EUREKA)	0.00	0.10	0.00	0.10	0.00	0.00	0.00	0.10
LANDER CO., NEV (AUSTIN)	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10
NYE CO., NEV (TONOPAH)	0.20	0.10	0.10	0.20	0.10	1.10	2.10	5.50
JUAB CO., UT								
EUREKA	0.00	0.10	0.10	0.20	0.40	0.00	0.00	0.10
NEPHI	0.10	0.20	0.50	0.70	1.30	0.10	0.10	0.20
WASHINGTON CO., UT (ST. GEORGE)	0.90	2.20	2.20	1.10	0.50	1.00	0.80	1.00

SOURCE: HDR SCIENCES, BASED ON A GRAVITY-MODEL FORMULATION USING POPULATION AND DISTANCE SQUARED.

TABLE 2.4-3. COMMUNITY SHARES IN CONSTRUCTION CAMP PAYROLL EXPENDITURES;
FULL DEPLOYMENT IN TEXAS/NEW MEXICO (PAGE 1 OF 3).
(PERCENT)

COMMUNITY	CONSTRUCTION CAMP NUMBER														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
OKLAHOMA															
OKLAHOMA CO (OKLAHOMA CITY)	3.793	4.478	4.001	5.768	6.042	5.482	4.485	6.941	7.836	4.176	9.701	9.371	9.602	8.937	6.335
CIMARRAN CO (BOISE CITY)	0.021	0.030	0.025	0.038	0.069	0.044	0.033	0.049	0.057	0.044	0.349	0.217	0.815	0.505	0.766
TEXAS CO (GUYMAN)	0.074	0.103	0.096	0.150	0.243	0.166	0.124	0.184	0.215	0.197	1.290	0.703	1.194	1.848	2.722
TEXAS															
DALLAM CO (DALHART)	0.046	0.082	0.075	0.101	0.218	0.160	0.120	0.175	0.238	0.230	7.945	1.159	9.465	12.102	7.863
HARTLEY CO (DALHART/HARTLEY)	0.046	0.082	0.075	0.101	0.218	0.160	0.120	0.175	0.238	0.230	7.945	1.159	9.465	12.102	7.863
SHERMAN CO (STRATFORD)	0.026	0.041	0.038	0.052	0.104	0.074	0.054	0.078	0.105	0.085	1.063	0.383	0.875	2.112	19.734
MOORE CO (DUMAS)	0.117	0.181	0.216	0.283	0.435	0.514	0.222	0.562	0.570	0.593	4.023	1.581	3.400	4.491	4.715
POTTER/RANDALL CO S															
AMARILLO	2.815	6.412	5.884	7.779	7.203	19.049	14.280	18.811	29.034	33.406	18.593	14.438	17.655	18.300	22.105
CANYON	0.187	0.473	0.436	0.567	0.514	1.758	1.287	1.626	1.746	1.387	1.000	0.676	0.803	0.816	0.889
DEAF SMITH CO (HEREFORD)	0.418	1.393	1.305	1.618	1.378	11.581	7.778	8.027	8.100	29.923	1.924	1.567	1.516	1.228	0.850
SWISHER CO (TULIA)	0.109	0.289	0.394	0.276	0.257	0.648	1.378	1.933	0.672	0.486	0.382	0.305	0.411	0.325	0.305
PARMER CO (FARWELL)	0.058	0.345	0.533	0.444	0.412	0.969	0.615	0.157	0.159	0.120	0.087	0.159	0.074	0.057	0.037
BAILEY CO (MULESHOE)	0.172	0.685	0.531	0.091	0.072	1.300	4.872	1.043	0.497	0.271	0.253	0.432	0.221	0.172	0.141
LAMB CO															
LITTLEFIELD	0.276	0.421	2.022	0.689	0.595	0.781	1.446	0.739	0.606	0.266	0.269	0.433	0.244	0.193	0.151
OLTON	0.048	0.115	0.420	0.121	0.150	0.193	0.520	0.602	0.249	0.154	0.069	0.111	0.063	0.050	0.052
EARTH	0.036	0.092	0.630	0.151	0.126	0.186	0.757	0.486	0.184	0.117	0.053	0.087	0.047	0.044	0.036

TABLE 2.4-3. COMMUNITY SHARES IN CONSTRUCTION CAMP PAYROLL EXPENDITURES
FULL DEPLOYMENT IN TEXAS/NEW MEXICO (PAGE 2 OF 3)
(PERCENT)

COMMUNITY	CONSTRUCTION CAMP NUMBER														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
TEXAS															
LUBBOCK CO															
LUBBOCK	11.429	17.816	23.964	12.188	11.212	11.961	16.523	14.686	10.955	4.896	5.859	9.178	5.469	5.732	4.871
SLATON	0.279	0.418	0.691	0.271	0.257	0.255	0.387	0.369	0.269	0.128	0.163	0.249	0.154	0.165	0.133
WOLFFORTH	0.069	0.074	0.098	0.048	0.045	0.052	0.067	0.065	0.046	0.022	0.024	0.042	0.026	0.025	0.023
SHALLOWATER	0.064	0.091	0.396	0.070	0.065	0.093	0.100	0.079	0.072	0.027	0.042	0.066	0.038	0.031	0.028
HALE CO															
ABERNATHY	0.127	0.175	0.291	0.134	0.126	0.125	0.161	0.277	0.121	0.094	0.070	0.108	0.066	0.077	0.032
PLAINVIEW	0.680	1.293	2.829	1.389	1.260	1.407	2.763	3.550	1.243	1.076	0.648	1.003	0.878	0.725	0.805
HALE CENTER	0.071	0.105	0.211	0.114	0.105	0.112	0.201	0.266	0.103	0.085	0.056	0.086	0.076	0.079	0.067
FLOYD CO															
LOCKNEY	0.680	1.293	2.829	1.389	1.260	1.407	2.763	3.550	1.243	1.076	0.648	1.003	0.878	0.725	0.805
FLOYDADA	0.104	0.170	0.304	0.190	0.179	0.178	0.282	0.387	0.172	0.132	0.102	0.153	0.135	0.139	0.114
PETERSBURG	0.050	0.063	0.110	0.051	0.049	0.062	0.103	0.140	0.059	0.046	0.034	0.051	0.045	0.047	0.039
LYNN CO (TAHOKA)	0.164	0.149	0.236	0.116	0.111	0.106	0.129	0.132	0.106	0.047	0.064	0.097	0.141	0.065	0.098
TERRY CO (BROWNFIELD)	0.837	0.941	1.174	0.461	0.433	0.432	0.554	0.412	0.417	0.168	0.247	0.370	0.233	0.228	0.165
YOAKUM CO (PLAINS)	0.165	0.222	0.195	0.058	0.054	0.056	0.075	0.058	0.052	0.021	0.029	0.045	0.028	0.020	0.014
HOCKLEY CO (LEVELLAND)	0.680	1.759	3.275	0.811	0.735	0.825	1.084	0.837	0.725	0.265	0.376	0.583	0.337	0.266	0.661
COCHRAN CO (MORTON)	0.206	1.277	2.707	0.261	0.227	0.287	0.609	0.278	0.230	0.088	0.105	0.168	0.200	0.082	0.059
EL PASO CO (EL PASO)	6.737	3.678	2.874	3.828	3.374	2.188	1.850	2.955	2.722	1.162	2.782	3.698	2.823	2.381	1.324
TARRANT (DALLAS/FT WORTH)	14.668	13.193	13.802	14.557	15.388	9.677	10.003	13.074	13.694	6.120	12.954	15.152	13.280	12.865	8.626
OLDHAM CO (VEGA)	0.018	0.042	0.045	0.059	0.108	0.177	0.112	0.164	1.625	3.751	0.171	0.180	0.193	0.188	0.112
CASTRO CO (DIMMITT)	0.120	0.284	0.852	0.349	0.310	1.340	7.279	8.244	1.202	1.806	0.420	0.360	0.347	0.205	0.193

TABLE 2.4-3. COMMUNITY SHARES IN CONSTRUCTION CAMP PAYROLL EXPENDITURES; FULL DEPLOYMENT IN TEXAS/NEW MEXICO (PAGE 3 OF 3).
(PERCENT)

COMMUNITY	CONSTRUCTION CAMP NUMBER														
NEW MEXICO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
QUAY CO															
LOGAN	0.010	0.025	0.014	0.030	0.078	0.022	0.016	0.019	0.022	0.023	0.322	1.084	0.119	0.075	0.038
TUCUMCARI	0.194	0.466	0.264	0.556	1.416	0.407	0.288	0.354	0.412	0.423	2.565	5.582	1.309	0.656	0.463
GUADALUPE CO															
SANTA ROSA	0.118	0.123	0.073	0.433	0.263	0.102	0.077	0.063	0.099	0.057	0.257	0.412	0.180	0.107	0.072
VAUGHN	0.062	0.036	0.022	0.114	0.074	0.030	0.023	0.021	0.030	0.012	0.045	0.075	0.135	0.026	0.017
CURRY CO (CLOVIS)	2.124	15.319	10.270	22.141	19.586	16.163	10.912	3.865	5.011	2.798	3.860	6.198	2.701	1.569	1.029
DEBACA CO (FT. SUMNER)	0.138	0.166	0.107	1.100	2.935	0.133	0.099	0.069	0.112	0.043	0.082	0.114	0.063	0.041	0.026
ROOSEVELT CO (PORTALES)	0.783	11.855	2.609	3.146	2.983	2.227	1.582	0.778	0.983	0.528	0.709	1.262	0.607	0.467	0.239
CHAVES CO															
ROSWELL	32.553	1.904	1.005	3.316	1.219	1.457	1.113	1.102	1.463	0.589	1.106	1.670	1.037	0.836	0.446
HAGERMAN	0.287	0.029	0.018	0.053	0.034	0.025	0.020	0.020	0.026	0.011	0.021	0.031	0.018	0.016	0.009
DEXTER	0.345	0.031	0.019	0.057	0.036	0.026	0.020	0.021	0.027	0.011	0.020	0.032	0.020	0.017	0.009
EDDY CO															
CARLSBAD	2.422	0.760	0.670	0.801	0.592	0.409	0.359	0.409	0.462	0.192	0.408	0.577	0.397	0.327	0.178
ARTESIA	1.875	0.276	0.162	0.450	0.209	0.218	0.168	0.189	0.236	0.097	0.197	0.285	0.170	0.154	0.083
SANTA FE CO (SANTA FE)	1.626	1.025	0.719	2.200	2.916	0.873	0.680	0.727	1.003	0.518	1.779	2.685	1.669	1.175	0.744
BERNALILLO CO (ALBUQUERQUE)	6.948	4.384	3.081	9.373	12.401	3.737	2.911	3.119	4.301	2.220	7.610	11.458	7.149	5.039	3.187
LEA CO															
TATUM	0.325	0.458	0.275	0.274	0.277	0.251	0.239	0.236	0.238	0.219	0.233	0.252	0.230	0.224	0.213
LOVINGTON	1.629	1.876	0.467	0.472	0.515	0.336	0.256	0.302	0.270	0.134	0.248	0.377	0.231	0.186	0.079
HOBBS	3.682	3.826	1.219	1.351	1.427	0.919	0.705	0.881	0.788	0.386	0.749	1.113	0.709	0.575	0.308
UNION CO (CLAYTON)	0.040	0.060	0.054	0.086	0.165	0.055	0.071	0.110	0.195	0.138	0.739	0.535	2.960	1.425	0.874
HARDING CO	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	2.000	0.100	0.100	0.100

SOURCE: HDR SCIENCES, BASED ON A GRAVITY-MODEL FORMULATION USING POPULATION AND DISTANCE SQUARED.

TABLE 2.4-4. COMMUNITY SHARES IN CONSTRUCTION CAMP PAYROLL EXPENDITURES SPLIT DEPLOYMENT IN TEXAS/NEW MEXICO (PAGE 1 of 3). (PERCENT)

COMMUNITY	CONSTRUCTION CAMP NUMBER						
	1	2	3	4	5	6	7
OKLAHOMA							
OKLAHOMA CO. (OKLAHOMA CITY)	3.793	4.478	6.042	7.836	9.701	9.371	9.602
CIMARRAN CO. (BOISE CITY)	0.021	0.030	0.069	0.057	0.349	0.217	0.815
TEXAS CO. (GUYMAN)	0.074	0.103	0.243	0.215	1.290	0.703	1.194
TEXAS							
DALLAM CO. (DALHART)	0.046	0.082	0.218	0.238	7.945	1.159	9.465
HARTLEY CO. (DALHART/HARTLEY)	0.046	0.082	0.218	0.238	7.945	1.159	9.465
SHERMAN CO. (STRATFORD)	0.026	0.041	0.104	0.105	1.063	0.383	0.875
MOORE CO. (DUMAS)	0.117	0.181	0.435	0.570	4.023	1.581	3.400
POTTER/RANDALL CO.S							
AMARILLO	2.815	6.412	7.203	29.034	18.593	14.438	17.655
CANYON	0.187	0.473	0.514	1.746	1.000	0.676	0.803
DEAF SMITH CO. (HEREFORD)	0.418	1.393	1.378	8.100	1.924	1.567	1.516
SWISHER CO. (TULIA)	0.109	0.289	0.257	0.672	0.382	0.305	0.411
PARMER CO. (FARWELL)	0.058	0.345	0.412	0.159	0.087	0.159	0.074
BAILEY CO. (MULESHOE)	0.172	0.685	0.872	0.497	0.253	0.432	0.221
LAMB CO.							
LITTLEFIELD	0.276	0.421	0.595	0.606	0.269	0.433	0.244
OLTON	0.048	0.115	0.150	0.249	0.069	0.110	0.063
EARTH	0.036	0.099	0.126	0.184	0.053	0.087	0.047

TABLE 2.4-4. COMMUNITY SHARES IN CONSTRUCTION CAMP PAYROLL EXPENDITURES
SPLIT DEPLOYMENT IN TEXAS/NEW MEXICO (PAGE 2 of 3).
(PERCENT)

COMMUNITY	CONSTRUCTION CAMP NUMBER						
	1	2	3	4	5	6	7
TEXAS							
LUBBOCK CO							
LUBBOCK	11.429	17.816	11.212	10.955	5.859	9.178	5.467
SLATON	0.279	0.418	0.257	0.269	0.163	0.249	0.154
WOLFFORTH	0.069	0.074	0.045	0.046	0.024	0.042	0.026
SHALLOWATER	0.064	0.091	0.065	0.072	0.042	0.066	0.038
HALE CO.							
ABERNATHY	0.127	0.175	0.126	0.121	0.070	0.108	0.066
PLAINVIEW	0.680	1.293	1.260	1.243	0.648	1.003	0.878
HALE CENTER	0.071	0.105	0.105	0.103	0.056	0.086	0.074
FLOYD CO.							
LOCKNEY	0.680	1.293	1.260	1.243	0.648	1.003	0.878
FLOYDADA	0.104	0.170	0.179	0.172	0.102	0.153	0.135
PETERSBURG	0.050	0.063	0.049	0.059	0.034	0.051	0.045
LYNN CO. (TAHOKA)	0.164	0.149	0.111	0.106	0.064	0.097	0.141
TERRY CO (BROWNFIELD)	0.837	0.941	0.433	0.417	0.247	0.370	0.333
YOAKUM CO (PLAINS)	0.165	0.222	0.054	0.052	0.029	0.045	0.038
HOCKLEY CO (LEVELLAND)	0.660	1.759	0.735	0.723	0.376	0.583	0.337
COCHRAN CO (MORTON)	0.206	1.277	0.227	0.230	0.105	0.168	0.200
EL PASO CO (EL PASO)	6.737	3.678	3.374	2.722	2.782	3.698	2.823
TARRANT (DALLAS/FT WORTH)	14.668	13.193	15.388	13.694	12.954	17.052	13.280
OLDHAM CO (VEGA)	0.018	0.042	0.108	1.625	0.171	0.180	0.133
CASTRO CO (DIMMITT)	0.120	0.284	0.310	1.202	0.420	0.360	0.317

TABLE 2.4-4. COMMUNITY SHARES IN CONSTRUCTION CAMP PAYROLL EXPENDITURES SPLIT DEPLOYMENT IN TEXAS/NEW MEXICO (PAGE 3 of 3). (PERCENT)

COMMUNITY	CONSTRUCTION CAMP NUMBER						
	1	2	3	4	5	6	7
NEW MEXICO							
QUAY CO.							
LOGAN	0.010	0.025	0.078	0.022	0.322	1.084	0.119
TUCUMCARI	0.194	0.466	1.416	0.412	2.565	5.582	1.309
GUADALUPE CO.							
SANTA ROSA	0.118	0.123	0.263	0.099	0.257	0.412	0.180
VAUGHN	0.062	0.036	0.074	0.030	0.045	0.075	0.135
CURRY CO. (CLOVIS)	2.124	15.319	19.585	5.011	3.860	6.197	2.701
DEBACA CO. (FT. SUMNER)	0.138	0.166	2.935	0.112	0.082	0.114	0.063
ROOSEVELT CO. (PORTALES)	0.783	11.855	2.983	0.983	0.709	1.262	0.607
CHAVES CO.							
ROSWELL	32.553	1.904	1.219	1.463	1.106	1.670	1.037
HAGERMAN	0.287	0.029	0.034	0.026	0.021	0.031	0.018
DEXTER	0.345	0.031	0.036	0.027	0.020	0.032	0.020
EDDY CO.							
CARLSBAD	2.422	0.960	0.592	0.462	0.408	0.577	0.397
ARTESIA	1.875	0.276	0.209	0.236	0.197	0.285	0.170
SANTA FE CO. (SANTA FE)	1.626	1.025	2.916	1.003	1.779	2.685	1.669
BERNALILLO CO. (ALBUQUERQUE)	6.948	4.384	12.401	4.301	7.610	11.458	7.149
LEA CO.							
TATUM	0.325	0.458	0.077	0.038	0.033	0.052	0.030
LOVINGTON	1.620	1.876	0.515	0.270	0.248	0.377	0.231
HOBBS	3.682	3.828	1.427	0.788	0.749	1.113	0.709
UNION CO. (CLAYTON)	0.040	0.060	0.165	0.195	0.739	0.535	2.960
HARDING CO.	0.100	0.100	0.100	0.100	0.100	0.100	0.100

SOURCE: HDR SCIENCES, BASED ON A GRAVITY-MODEL FORMULATION USING POPULATION AND DISTANCE SQUARED.

Table 2.4-5. Regional allocation assumptions for base payroll expenditures, Nevada/Utah (percent).

COUNTY	BASE LOCATION				
	COYOTE SPRING	MILFORD	BERYL	DELTA	ELY
Clark, Nevada	95	15	15	—	5
Washoe, Nevada	—	—	—	—	—
Salt Lake/Utah, Utah	—	15	13	25	3
Beaver, Utah	—	35	14	—	—
Iron, Utah	—	20	35	—	—
Lincoln, Nevada	5	5	8	—	2
White Pine, Nevada	—	—	—	—	80
Washington, Utah	—	10	15	—	—
Millard, Utah	—	—	—	70	—
Juab, Utah	—	—	—	5	—
Total	100	100	100	100	100

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Source: HDR Sciences.

TABLE 2.4-6. COMMUNITY SHARES IN BASE PAYROLL EXPENDITURES
TEXAS/NEW MEXICO
(PERCENT)

COMMUNITY	BASE LOCATION	
	DALHART, TX	CLOVIS, NM
POTTER/RANDALL COS. (AMARILLO TX.)	0.400	0.100
MOORE CO., TX (DUMAS)	0.200	0.000
DALLAM CO., TX (DALHART)	0.150	0.000
HARTLEY CO., TX		
DALHART	0.150	0.000
HARTLEY	0.100	0.000
LUBBOCK CO., TX (LUBBOCK)	0.000	0.150
CURRY CO., NM (CLOVIS)	0.000	0.500
ROOSEVELT CO., NM (PORTALES)	0.000	0.200
CHAVES CO., NM (ROSWELL)	0.000	0.050

SOURCE: HDR SCIENCES.

TABLE 2.4-7. CAMP PAYROLL EXPENDITURES PER COMMUNITY, FULL DEPLOYMENT IN NEVADA/UTAH.

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO ,NEV (LAS VEGAS)	0	1312	18012	70772	135388	112630	96063	43116	304	0	0	0	0
WASHOE CO ,NEV (RENO)	0	1489	12030	30052	28926	33084	36904	18052	102	0	0	0	0
SALT LAKE CO ,UT	0	440	15676	85312	164194	152468	121817	52019	230	0	0	0	0
SALT LAKE CITY	0	389	13422	74114	145612	135404	106977	45815	205	0	0	0	0
PROVO	0	51	2254	11197	18581	17063	14840	6204	24	0	0	0	0
MILLARD CO ,UT	0	8	1185	4903	5828	4535	3875	1516	3	0	0	0	0
LYNNDYL	0	0	82	352	438	326	264	112	0	0	0	0	0
DELTA	0	4	907	3617	3923	2791	2248	855	2	0	0	0	0
FILLMORE	0	4	196	934	1467	1418	1363	549	1	0	0	0	0
BEAVER CO ,UT (MILFORD)	0	13	393	2212	3409	2877	2606	846	2	0	0	0	0
IRON CO ,UT	0	77	1290	6078	8967	6839	5772	2075	10	0	0	0	0
BERYL	0	1	19	81	113	74	59	20	0	0	0	0	0
CEDAR CITY	0	76	1271	5997	8854	6765	5719	2055	10	0	0	0	0
LINCOLN CO ,NEV (CALIENTE)	0	118	1029	2780	2398	1662	1893	824	4	0	0	0	0
WHITE PINE CO ,NEV (ELY)	0	29	1067	12818	29276	14691	10239	4578	19	0	0	0	0
EUREKA CO ,NEV (EUREKA)	0	0	25	417	2362	2263	1843	817	0	0	0	0	0
LANDER CO ,NEV (AUSTIN)	0	0	15	160	599	1502	2114	1261	1	0	0	0	0
NYE CO ,NEV (TONOPAH)	0	7	258	2142	5218	27517	40752	23920	236	0	0	0	0
JUAB CO ,UT	0	3	246	1157	1734	1492	1277	545	1	0	0	0	0
EUREKA	0	0	53	252	384	338	280	114	0	0	0	0	0
NEPHI	0	3	193	905	1349	1154	996	431	1	0	0	0	0
WASHINGTON CO ,UT (ST GEORGE)	0	30	466	2107	4110	3299	2247	913	6	0	0	0	0
TOTALS	0	3526	51692	220909	392407	364858	327401	150482	917	0	0	0	0

SOURCE: HDR SCIENCES.

TABLE 2.4-8. CAMP PAYROLL EXPENDITURES PER COMMUNITY, SPLIT DEPLOYMENT IN NEVADA/UTAH.

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO ,NEV (LAS VEGAS)	0	1312	19499	63814	75392	73299	64554	29736	0	0	0	0	0
WASHOE CO ,NEV (RENO)	0	1489	12613	25734	12374	8224	7035	3000	0	0	0	0	0
SALT LAKE CO ,UT	0	442	11745	56873	72243	60883	39801	14772	0	0	0	0	0
SALT LAKE CITY	0	389	10126	48623	62248	52814	34935	13027	0	0	0	0	0
PROVO	0	53	1618	8249	9995	8069	4866	1744	0	0	0	0	0
MILLARD CO ,UT	0	6	778	4590	4042	2283	1012	356	0	0	0	0	0
LYNNDYL	0	0	45	283	233	142	34	1	0	0	0	0	0
DELTA	0	3	589	3459	2612	1326	673	255	0	0	0	0	0
FILLMORE	0	3	144	848	1197	815	305	100	0	0	0	0	0
BEAVER CO ,UT (MILFORD)	0	14	235	1302	3034	3122	1126	194	0	0	0	0	0
IRON CO ,UT	0	77	941	3483	6508	7758	3742	850	0	0	0	0	0
BERYL	0	0	0	0	17	40	17	0	0	0	0	0	0
CEDAR CITY	0	77	941	3483	6491	7718	3725	850	0	0	0	0	0
LINCOLN CO ,NEV (CALIENTE)	0	116	1037	2349	1821	1647	853	248	0	0	0	0	0
WHITE PINE CO ,NEV (ELY)	0	28	488	2199	3794	4253	3058	1095	0	0	0	0	0
EUREKA CO ,NEV (EUREKA)	0	0	0	15	51	55	93	48	0	0	0	0	0
LANDER CO ,NEV (AUSTIN)	0	0	0	8	35	59	61	26	0	0	0	0	0
NYE CO ,NEV (TONOPAH)	0	7	216	962	1510	1991	2900	1485	0	0	0	0	0
JUAB CO ,UT	0	3	155	863	894	656	399	148	0	0	0	0	0
EUREKA	0	0	26	174	175	127	110	48	0	0	0	0	0
NEPHI	0	3	128	689	718	529	288	99	0	0	0	0	0
WASHINGTON CO ,UT (ST. GEORGE)	0	31	424	1421	2005	2370	2018	751	0	0	0	0	0
TOTALS	0	3525	48129	163612	183702	166200	126651	48707	0	0	0	0	0

SOURCE: HDR SCIENCES.

TABLE 2.4-9. CAMP PAYROLL EXPENDITURES PER COMMUNITY, FULL DEPLOYMENT IN TEXAS/NEW MEXICO

(THOUSANDS OF FY 1980 $) (PAGE 1 of 3).

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
OKLAHOMA													
OKLAHOMA CO. (OKLAHOMA CITY)	0	1260	3281	11714	20004	24965	21423	8323	50	0	0	0	0
CIMARRAN CO. (BOISE CITY)	0	14	34	189	484	872	1018	483	6	0	0	0	0
TEXAS CO. (GUYMAN)	0	50	122	667	1431	2403	2920	1560	21	0	0	0	0
TEXAS													
DALLAM CO. (DALHART)	0	45	108	2624	6798	10922	12559	5226	62	0	0	0	0
HARTLEY CO. (DALHART/HARTLEY)	0	45	108	2624	6798	10922	12559	5226	62	0	0	0	0
SHERMAN CO. (STRATFORD)	0	21	52	435	997	5319	11372	8985	157	0	0	0	0
MOORE CO. (DUMAS)	0	90	225	1770	3960	5874	6346	3026	37	0	0	0	0
POTTER/RANDALL CO.S	0	1609	4626	21603	40796	57321	61531	30759	183	0	0	0	0
AMARILLO	0	1502	4305	20145	38211	54151	58580	29373	176	0	0	0	0
CANYON	0	107	320	1457	2585	3170	2950	1385	7	0	0	0	0
DEAF SMITH CO. (HEREFORD)	0	287	1092	5933	10336	13403	17035	10462	6	0	0	0	0
SWISHER CO. (TULIA)	0	53	156	704	1672	2116	1309	530	2	0	0	0	0
PARMER CO. (FARWELL)	0	85	236	778	935	824	586	183	0	0	0	0	0
BAILEY CO. (MULESHOE)	0	181	475	2596	4923	6349	3208	577	1	0	0	0	0
LAMB CO.	0	181	475	1839	3327	4149	2552	767	1	0	0	0	0
LITTLEFIELD	0	124	325	1226	2026	2466	1603	468	1	0	0	0	0
OLTON	0	31	81	307	625	835	498	167	0	0	0	0	0
EARTH	0	26	69	306	676	848	451	132	0	0	0	0	0

TABLE 2.4-9. CAMP PAYROLL EXPENDITURES PER COMMUNITY, FULL DEPLOYMENT IN TEXAS/NEW MEXICO

(THOUSANDS OF FY 1980 $) (PAGE 2 OF 3).

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
TEXAS													
LUBBOCK CO	0	2413	7048	26377	39772	43093	29302	9776	39	0	0	0	0
LUBBOCK	0	2338	6824	25462	38343	41459	28218	9437	38	0	0	0	0
SLATON	0	53	157	616	963	1087	731	239	1	0	0	0	0
WOLFFORTH	0	9	28	112	172	178	120	40	0	0	0	0	0
SHALLOWATER	0	13	39	187	294	369	233	60	0	0	0	0	0
HALE CO	0	310	840	2984	5269	6719	4490	1599	7	0	0	0	0
ABERNATHY	0	26	74	277	441	531	365	129	0	0	0	0	0
PLAINVIEW	0	262	706	2500	4468	5735	3814	1358	6	0	0	0	0
HALE CENTER	0	21	59	206	359	451	309	111	0	0	0	0	0
FLOYD CO	0	68	185	643	1099	1386	977	355	0	0	0	0	0
LOCKNEY	0	21	57	198	340	433	303	109	0	0	0	0	0
FLOYDADA	0	37	99	331	557	707	507	185	0	0	0	0	0
PETERSBURG	0	10	29	114	202	246	167	61	0	0	0	0	0
LYNN CO (TAHOKA)	0	23	67	256	400	448	340	123	0	0	0	0	0
TERRY CO. (BROWNFIELD)	0	90	292	1224	1798	1734	1128	352	1	0	0	0	0
YOAKUM CO (PLAINS)	0	11	44	214	307	262	146	41	0	0	0	0	0
HOCKLEY CO. (LEVELLAND)	0	153	476	2077	3052	3574	2375	777	5	0	0	0	0
COCHRAN CO. (MORTON)	0	47	187	1137	1717	2085	1124	217	0	0	0	0	0
EL PASO CO (EL PASO)	0	703	2057	7365	11096	10582	7876	2694	10	0	0	0	0
TARRANT (DALLAS/FT. WORTH)	0	3209	8503	27251	40861	46183	37232	13543	69	0	0	0	0
OLDHAM CO (VEGA)	0	22	57	200	372	1143	2277	1425	0	0	0	0	0
CASTRO CO (DIMMITT)	0	64	203	1276	5127	6273	2376	952	1	0	0	0	0

TABLE 2.4-9. CAMP PAYROLL EXPENDITURES PER COMMUNITY, FULL DEPLOYMENT IN TEXAS/NEW MEXICO

(THOUSANDS OF FY 1980 $) (PAGE 3 OF 3).

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
NEW MEXICO													
QUAY CO	0	311	715	2340	4942	5952	3067	831	3	0	0	0	0
LOGAN	0	16	37	201	613	777	328	66	0	0	0	0	0
TUCUMCARI	0	295	678	2139	4329	5175	2739	765	3	0	0	0	0
GUADALUPE CO	0	69	170	462	691	847	714	231	0	0	0	0	0
SANTA ROSA	0	54	132	359	537	656	541	177	0	0	0	0	0
VAUGHN	0	15	38	103	154	191	173	54	0	0	0	0	0
CURRY CO (CLOVIS)	0	4085	10174	24622	24655	24726	21079	6856	8	0	0	0	0
DEBACA CO (FT. SUMNER)	0	612	1328	1793	632	593	756	255	0	0	0	0	0
ROOSEVELT CO (PORTALES)	0	622	2064	7249	7818	6246	3747	1169	1	0	0	0	0
CHAVES CO.	0	268	2131	13175	21357	8335	4338	1511	3	0	0	0	0
ROSWELL	0	254	2069	12875	20893	8102	4188	1458	3	0	0	0	0
HAGERMAN	0	7	29	139	215	111	72	25	0	0	0	0	0
DEXTER	0	7	33	160	248	121	76	26	0	0	0	0	0
EDDY CO.	0	167	625	2784	4233	2921	2009	678	2	0	0	0	0
CARLSBAD	0	123	430	1805	2675	1984	1361	451	1	0	0	0	0
ARTESIA	0	43	194	979	1558	937	647	227	0	0	0	0	0
SANTA FE CO. (SANTA FE)	0	608	1452	3489	4535	4970	3792	1364	5	0	0	0	0
BERNALILLO CO. (ALBUQUERQUE)	0	2586	6181	14885	19388	21252	17072	5839	25	0	0	0	0
LEA CO.	0	421	1507	6054	8059	5675	3367	1104	3	0	0	0	0
TATUM	0	16	73	341	439	253	120	38	0	0	0	0	0
LOVINGTON	0	107	408	1705	2251	1498	840	273	0	0	0	0	0
HOBBS	0	297	1025	4006	5368	3923	2407	792	2	0	0	0	0
UNION CO. (CLAYTON)	0	34	80	414	1266	2337	2492	878	7	0	0	0	0
HARDING CO.	0	20	57	282	967	1355	640	158	0	0	0	0	0
TOTALS	0	20834	57430	202025	311872	354146	307359	128831	775	0	0	0	0

SOURCE: HDR SCIENCES.

TABLE 2.4-10. CAMP PAYROLL EXPENDITURES PER COMMUNITY, SPLIT DEPLOYMENT IN TEXAS/NEW MEXICO (THOUSANDS OF FY 1980 $) (PAGE 1 of 3).

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
OKLAHOMA													
OKLAHOMA CO. (OKLAHOMA CITY)	0	0	84	2295	9627	14819	14828	7883	76	0	0	0	0
CIMARRAN CO. (BOISE CITY)	0	0	0	31	201	339	495	377	6	0	0	0	0
TEXAS CO. (GUYMAN)	0	0	1	116	729	1161	1055	636	9	0	0	0	0
TEXAS													
DALLAM CO. (DALHART)	0	0	1	526	3617	4808	4964	4106	75	0	0	0	0
HARTLEY CO. (DALHART/HARTLEY)	0	0	1	526	3617	4808	4964	4106	75	0	0	0	0
SHERMAN CO. (STRATFORD)	0	0	0	79	535	794	668	433	7	0	0	0	0
MOORE CO. (DUMAS)	0	0	2	311	2063	3114	2722	1752	27	0	0	0	0
POTTER/RANDALL CO.S	0	0	66	2890	15212	26567	33620	20588	147	0	0	0	0
AMARILLO	0	0	62	2720	14357	25131	31858	19528	141	0	0	0	0
CANYON	0	0	4	170	855	1435	1761	1059	6	0	0	0	0
DEAF SMITH CO. (HEREFORD)	0	0	9	392	1956	3731	6039	3835	12	0	0	0	0
SWISHER CO. (TULIA)	0	0	2	87	403	649	765	456	3	0	0	0	0
PARMER CO. (FARWELL)	0	0	1	57	285	476	358	125	0	0	0	0	0
BAILEY CO. (MULESHOE)	0	0	3	138	647	1082	907	358	1	0	0	0	0
LAMB CO.	0	0	7	203	796	1270	1319	627	1	0	0	0	0
LITTLEFIELD	0	0	6	148	555	855	851	391	1	0	0	0	0
OLTON	0	0	1	31	133	229	264	135	0	0	0	0	0
EARTH	0	0	0	24	108	186	204	101	0	0	0	0	0

TABLE 3.4 10. CAMP PAYROLL EXPENDITURES PER COMMUNITY, SPLIT DEPLOYMENT IN TEXAS/NEW MEXICO.

(THOUSANDS OF FY 1980 $) (PAGE 2 of 3).

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
TEXAS													
LUBBOCK CO	0	0	262	6051	18830	22253	17699	7918	44	0	0	0	0
LUBBOCK	0	0	254	5846	18196	21503	17085	7639	43	0	0	0	0
SLATON	0	0	6	142	445	531	430	196	1	0	0	0	0
WOLFFORTH	0	0	1	31	86	90	73	33	0	0	0	0	0
SHALLOWATER	0	0	1	32	103	129	111	50	0	0	0	0	0
HALE CO	0	0	19	489	1755	2487	2348	1139	8	0	0	0	0
ABERNATHY	0	0	2	63	195	234	193	87	0	0	0	0	0
PLAINVIEW	0	0	15	389	1433	2079	1986	970	7	0	0	0	0
HALE CENTER	0	0	1	37	126	174	167	81	0	0	0	0	0
FLOYD CO	0	0	4	113	402	568	547	268	1	0	0	0	0
LOCKNEY	0	0	1	32	119	173	166	81	0	0	0	0	0
FLOYDADA	0	0	2	57	206	298	288	141	1	0	0	0	0
PETERSBURG	0	0	1	24	77	97	93	46	0	0	0	0	0
LYNN CO (TAHOKA)	0	0	3	72	197	207	204	111	1	0	0	0	0
TERRY CO (BROWNFIELD)	0	0	18	382	1019	964	684	302	1	0	0	0	0
YOAKUM CO (PLAINS)	0	0	3	77	201	166	89	37	0	0	0	0	0
HOCKLEY CO (LEVELLAND)	0	0	14	409	1391	1669	1134	493	2	0	0	0	0
COCHRAN CO (MORTON)	0	0	4	196	733	844	420	193	1	0	0	0	0
EL PASO CO (EL PASO)	0	0	149	2754	6953	6600	5695	2633	22	0	0	0	0
TARRANT (DALLAS/FT WORTH)	0	0	326	6927	22194	28802	26706	12667	106	0	0	0	0
OLDHAM CO (VEGA)	0	0	0	20	130	393	1021	704	1	0	0	0	0
CASTRO CO (DIMMITT)	0	0	2	93	435	764	1051	634	2	0	0	0	0

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TABLE 2.4-10. CAMP PAYROLL EXPENDITURES PER COMMUNITY, SPLIT DEPLOYMENT IN TEXAS/NEW MEXICO.

(THOUSANDS OF FY 1980 $) (PAGE 3 of 3).

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
NEW MEXICO													
QUAY CO	0	0	4	297	2297	5459	4327	1273	10	0	0	0	0
LOGAN	0	0	0	26	250	708	557	131	0	0	0	0	0
TUCUMCARI	0	0	4	271	2047	4751	3770	1142	10	0	0	0	0
GUADALUPE CO.	0	0	3	93	375	616	549	230	2	0	0	0	0
SANTA ROSA	0	0	2	67	293	504	416	154	1	0	0	0	0
VAUGHN	0	0	1	26	82	112	133	76	1	0	0	0	0
CURRY CO (CLOVIS)	0	0	47	2404	12569	21132	14829	4602	21	0	0	0	0
DEBACA CO (FT. SUMNER)	0	0	3	66	618	1499	1299	257	0	0	0	0	0
ROOSEVELT CO (PORTALES)	0	0	17	1431	6229	7829	3029	884	4	0	0	0	0
CHAVES CO	0	0	737	11235	18475	3012	2575	1202	8	0	0	0	0
ROSWELL	0	0	723	11018	18096	2898	2475	1158	8	0	0	0	0
HAGERMAN	0	0	6	99	174	56	49	21	0	0	0	0	0
DEXTER	0	0	7	118	204	58	51	22	0	0	0	0	0
EDDY CO.	0	0	95	1577	3146	1701	1343	600	4	0	0	0	0
CARLSBAD	0	0	53	918	1940	1226	932	410	3	0	0	0	0
ARTESIA	0	0	41	658	1205	475	411	189	1	0	0	0	0
SANTA FE CO. (SANTA FE)	0	0	36	748	2665	4025	3587	1419	13	0	0	0	0
BERNALILLO CO. (ALBUQUERQUE)	0	0	154	3197	11385	17174	15314	6079	57	0	0	0	0
LEA CO.	0	0	125	2512	6309	5083	2721	1035	7	0	0	0	0
TATUM	0	0	7	153	387	289	106	34	0	0	0	0	0
LOVINGTON	0	0	36	730	1823	1420	689	252	1	0	0	0	0
HOBBS	0	0	81	1629	4098	3373	1925	748	5	0	0	0	0
UNION CO (CLAYTON)	0	0	0	65	431	795	1623	1346	23	0	0	0	0
HARDING CO	0	0	2	48	158	197	181	91	0	0	0	0	0
TOTALS	0	0	2200	48907	158582	197856	181675	91391	776	0	0	0	0

TABLE 3.4-11. BASE PAYROLL EXPENDITURES PER COMMUNITY — PROPOSED ACTION

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO., NEV (LAS VEGAS)	22155	41509	65287	80882	92917	81460	89051	94886	56435	55734	55734	55734	55734
WASHOE CO., NEV (RENO)	0	0	0	0	0	0	0	0	0	0	0	0	0
SALT LAKE CO., UT (SALT LAKE CITY)	0	0	0	538	5047	8345	8272	7844	5826	5826	5826	5826	5826
BEAVER CO., UT (MILFORD)	0	0	0	1255	11777	19472	19301	18304	13595	13595	13595	13595	13595
IRON CO., UT	0	0	0	717	6729	11127	11029	10459	7768	7768	7768	7768	7768
BERYL	0	0	0	0	0	0	0	0	0	0	0	0	0
CEDAR CITY	0	0	0	717	6729	11127	11029	10459	7768	7768	7768	7768	7768
LINCOLN CO., NEV (CALIENTE&VICINITY)	1166	2184	3436	4408	6307	6629	7008	7196	4605	4568	4568	4568	4568
WHITE PINE CO., NEV (ELY&VICINITY)	0	0	0	0	0	0	0	0	0	0	0	0	0
WASHINGTON CO., UT (ST GEORGE)	0	0	0	358	3364	5563	5514	5229	3884	3884	3884	3884	3884
TOTALS	23321	43693	68723	88158	126141	132596	140175	143918	92113	91375	91375	91375	91375

SOURCE: HDR SCIENCES.

ALTERNATIVE 1

TABLE 2.4-12. BASE PAYROLL EXPENDITURES PER COMMUNITY

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO.,NEV (LAS VEGAS)	22155	41509	65287	80882	92917	81460	89051	94886	56435	55734	55734	55734	55734
WASHOE CO.,NEV (RENO)	0	0	0	0	0	0	0	0	0	0	0	0	0
SALT LAKE CO.,UT (SALT LAKE CITY)	0	0	0	466	4374	7232	7169	6798	5049	5049	5049	5049	5049
BEAVER CO.,UT (MILFORD)	0	0	0	502	4710	7789	7720	7321	5438	5438	5438	5438	5438
IRON CO.,UT	0	0	0	1255	11776	19472	19301	18303	13594	13594	13594	13594	13594
BERYL	0	0	0	538	5047	8345	8272	7844	5826	5826	5826	5826	5826
CEDAR CITY	0	0	0	717	6729	11127	11029	10459	7768	7768	7768	7768	7768
LINCOLN CO.,NEV (CALIENTE&VICINITY)	1166	2184	3436	4515	7316	8299	8663	8764	5771	5734	5734	5734	5734
WHITE PINE CO.,NEV (ELY&VICINITY)	0	0	0	0	0	0	0	0	0	0	0	0	0
WASHINGTON CO.,UT (ST. GEORGE)	0	0	0	538	5047	8345	8272	7844	5826	5826	5826	5826	5826
TOTALS	23321	43693	68723	88138	126140	132597	140176	143916	92113	91375	91375	91375	91375

SOURCE: HDR SCIENCES

ALTERNATIVE 2

TABLE 2.4-13. BASE PAYROLL EXPENDITURES PER COMMUNITY

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO., NEV (LAS VEGAS)	22155	41509	65287	80344	87870	73115	80778	87041	50608	49908	49908	49908	49908
LINCOLN CO., NV (CALIENTE & VIC)	1166	2184	3436	4228	4624	3848	4251	4581	2663	2626	2626	2626	2626
MILLARD CO., UT (DELTA & VIC)	0	0	0	2511	23554	38945	38602	36608	27190	27190	27190	27190	27190
JUAB CO., UT (EUREKA & NEPHI)	0	0	0	179	1682	2781	2757	2614	1942	1942	1942	1942	1942
SALT LAKE/UTAH, UT	0	0	0	897	8412	13909	13786	13074	9710	9710	9710	9710	9710
TOTALS	23321	43693	68723	88159	126142	132598	140174	143918	92113	91376	91376	91376	91376

SOURCE: HDR SCIENCES

ALTERNATIVE 3

TABLE 2.4-14. BASE PAYROLL EXPENDITURES PER COMMUNITY

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO., NEV. (LAS VEGAS)	3094	5816	9287	11762	14639	13890	14997	15771	9784	9684	9684	9684	9684
WASHOE CO., NEV (RENO)	0	0	0	121	1110	1825	1776	1648	1192	1192	1192	1192	1192
SALT LAKE CO., UT (SALT LAKE CITY)	2682	5040	8048	10423	14785	15487	16354	16782	10732	10645	10645	10645	10645
BEAVER CO., UT (MILFORD)	2888	5428	8667	10788	11935	10124	11233	12155	7277	7183	7183	7183	7183
IRON CO., UT	7220	13571	21669	26971	29838	25310	28082	30387	18193	17958	17958	17958	17958
BERYL	3094	5816	9287	11559	12788	10847	12035	13023	7797	7696	7696	7696	7696
CEDAR CITY	4126	7755	12382	15412	17050	14463	16047	17364	10396	10262	10262	10262	10262
LINCOLN CO., NEV (CALIENTE&VICINITY)	1650	3102	4953	6246	7560	7002	7603	8044	4953	4899	4899	4899	4899
WHITE PINE CO., NEV (ELY&VICINITY)	0	0	0	3244	29616	48687	47385	43965	31797	31797	31797	31797	31797
WASHINGTON CO., UT (ST. GEORGE)	3094	5816	9287	11559	12788	10847	12035	13023	7797	7696	7696	7696	7696
TOTALS	20628	38773	61911	81114	122271	133172	139465	141775	91725	91054	91054	91054	91054

SOURCE: HDR SCIENCES

ALTERNATIVE 4

TABLE 2.4-15. BASE PAYROLL EXPENDITURES PER COMMUNITY

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO ,NEV (LAS VEGAS)	3094	5816	9287	15412	47957	68663	68305	65232	45557	45456	45456	45456	45456
WASHOE CO ,NEV (RENO)	0	0	0	0	0	0	0	0	0	0	0	0	0
SALT LAKE CO ,UT (SALT LAKE CITY)	2682	5040	8048	10018	11083	9401	10431	11286	6757	6670	6670	6670	6670
BEAVER CO ,UT (MILFORD)	2888	5428	8667	10788	11935	10124	11233	12155	7277	7183	7183	7183	7183
IRON CO ,UT	7220	13571	21669	26971	29838	25310	28082	30387	18193	17958	17958	17958	17958
BERYL	3094	5816	9287	11559	12788	10847	12035	13023	7797	7696	7696	7696	7696
CEDAR CITY	4126	7755	12382	15412	17050	14463	16047	17364	10396	10262	10262	10262	10262
LINCOLN CO ,NEV (CALIENTE&VICINITY)	1650	3102	4953	6367	8671	8828	9380	9693	6145	6092	6092	6092	6092
WHITE PINE CO ,NEV (ELY&VICINITY)	0	0	0	0	0	0	0	0	0	0	0	0	0
WASHINGTON CO ,UT (ST GEORGE)	3094	5816	9287	11559	12788	10847	12035	13023	7797	7696	7696	7696	7696
TOTALS	20628	38773	61911	81115	122272	133173	139466	141776	91726	91055	91055	91055	91055

SOURCE: HDR SCIENCES

ALTERNATIVE 5

TABLE 2.4-16. BASE PAYROLL EXPENDITURES PER COMMUNITY

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO., NEV (LAS VEGAS)	3094	5816	9287	11762	14639	13890	14997	15771	9784	9684	9684	9684	9684
WASHOE CO., NEV (RENO)	0	0	0	121	1110	1825	1776	1648	1192	1192	1192	1192	1192
SALT LAKE CO., UT (SALT LAKE CITY)	3094	5816	9287	11965	16490	16933	17959	18518	11771	11671	11671	11671	11671
BEAVER CO., UT (MILFORD)	7220	13571	21669	26972	29839	25311	28083	30387	18193	17959	17959	17959	17959
IRON CO., UT	4126	7755	12382	15412	17050	14463	16047	17364	10396	10262	10262	10262	10262
BERYL	0	0	0	0	0	0	0	0	0	0	0	0	0
CEDAR CITY	4126	7755	12382	15412	17050	14463	16047	17364	10396	10262	10262	10262	10262
LINCOLN CO., NEV (CALIENTE&VICINITY)	1031	1938	3095	3934	5003	4833	5196	5440	3394	3360	3360	3360	3360
WHITE PINE CO., NEV (ELY&VICINITY)	0	0	0	3244	29616	48687	47385	43965	31797	31797	31797	31797	31797
WASHINGTON CO., UT (ST. GEORGE)	2063	3877	6191	7706	8525	7231	8023	8682	5198	5131	5131	5131	5131
TOTALS	20628	38773	61911	81116	122272	133173	139466	141775	91725	91056	91056	91056	91056

SOURCE: HDR SCIENCES

ALTERNATIVE 6

TABLE 2.4-17. BASE PAYROLL EXPENDITURES PER COMMUNITY

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO., NEV. (LAS VEGAS)	3094	5816	9287	15412	47957	68663	68305	65232	45557	45456	45456	45456	45456
WASHOE CO., NEV (RENO)	0	0	0	0	0	0	0	0	0	0	0	0	0
SALT LAKE CO., UT (SALT LAKE CITY)	3094	5816	9287	11559	12788	10847	12035	13023	7797	7696	7696	7696	7696
BEAVER CO., UT (MILFORD)	7220	13571	21669	26972	29839	25311	28083	30387	18193	17959	17959	17959	17959
IRON CO., UT	4126	7755	12382	15412	17050	14463	16047	17364	10396	10262	10262	10262	10262
BERYL	0	0	0	0	0	0	0	0	0	0	0	0	0
CEDAR CITY	4126	7755	12382	15412	17050	14463	16047	17364	10396	10262	10262	10262	10262
LINCOLN CO., NEV (CALIENTE&VICINITY)	1031	1938	3095	4056	6113	6658	6973	7088	4586	4552	4552	4552	4552
WHITE PINE CO., NEV (ELY&VICINITY)	0	0	0	0	0	0	0	0	0	0	0	0	0
WASHINGTON CO., UT (ST. GEORGE)	2063	3877	6191	7706	8525	7231	8023	8682	5198	5131	5131	5131	5131
TOTALS	20628	38773	61911	81117	122272	133173	139466	141776	91727	91056	91056	91056	91056

SOURCE: HDR SCIENCES

TABLE 3.4-18. BASE PAYROLL EXPENDITURES PER COMMUNITY ALTERNATIVE 7

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
POTTER/RANDALL COS (AMARILLO TX)	2430	4559	7131	10532	25413	33831	33508	31892	21186	21109	21109	21109	21109
MOORE CO ,TX (DUMAS)	0	0	0	889	7930	12971	12411	11283	7949	7949	7949	7949	7949
DALLAM CO ,TX (DALHART)	0	0	0	666	5947	9728	9308	8462	5962	5962	5962	5962	5962
HARTLEY CO ,TX	0	0	0	1110	9912	16213	15513	14103	9936	9936	9936	9936	9936
DALHART	0	0	0	666	5947	9728	9308	8462	5962	5962	5962	5962	5962
HARTLEY	0	0	0	444	3965	6485	6205	5641	3974	3974	3974	3974	3974
LUBBOCK CO ,TX (LUBBOCK)	3646	6839	10697	13131	14329	11833	13026	13986	7932	7815	7815	7815	7815
CURRY CO ,NM (CLOVIS)	12154	22797	35659	43771	47763	39445	43422	46622	26440	26052	26052	26052	26052
ROOSEVELT CO ,NM (PORTALES)	4861	9119	14263	17508	19105	15778	17368	18649	10576	10420	10420	10420	10420
CHAVES CO ,NM (ROSWELL)	1215	2279	3565	4377	4776	3944	4342	4662	2644	2605	2605	2605	2605
TOTALS	24306	45593	71315	91984	135175	143743	148898	149659	92625	91848	91848	91848	91848

SOURCE: HDR SCIENCES

TABLE 2.4-19. BASE PAYROLL EXPENDITURES PER COMMUNITY

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(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO ,NEV (LAS VEGAS)	21192	39145	64411	74598	78759	63041	70970	77125	49800	49100	49100	49100	49100
LINCOLN CO , NV (CALIENTE & VIC)	1115	2060	3390	3926	4145	3317	3735	4059	2621	2584	2584	2584	2584
MILLARD CO , UT (DELTA & VIC)	0	0	0	0	0	0	0	0	0	0	0	0	0
JUAB CO , UT (EUREKA & NEPHI)	0	0	0	0	0	0	0	0	0	0	0	0	0
SALT LAKE/UTAH, UT	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	22307	41205	67801	78524	82904	66358	74705	81184	52421	51684	51684	51684	51684

SOURCE: HDR SCIENCES

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TABLE 2.4-20. BASE PAYROLL EXPENDITURES PER COMMUNITY

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
POTTER/RANDALL COS (AMARILLO TX.)	2325	4298	7032	8119	8543	6774	7597	8232	5204	5127	5127	5127	5127
MOORE CO., TX (DUMAS)	0	0	0	0	0	0	0	0	0	0	0	0	0
DALLAM CO., TX (DALHART)	0	0	0	0	0	0	0	0	0	0	0	0	0
HARTLEY CO., TX	0	0	0	0	0	0	0	0	0	0	0	0	0
DALHART	0	0	0	0	0	0	0	0	0	0	0	0	0
HARTLEY	0	0	0	0	0	0	0	0	0	0	0	0	0
LUBBOCK CO., TX (LUBBOCK)	3487	6447	10549	12179	12815	10161	11396	12348	7807	7690	7690	7690	7690
CURRY CO., NM (CLOVIS)	11625	21493	35164	40599	42718	33872	37988	41161	26024	25636	25636	25636	25636
ROOSEVELT CO., NM (PORTALES)	4650	8597	14065	16239	17087	13548	15195	16464	10409	10254	10254	10254	10254
CHAVES CO., NM (ROSWELL)	1162	2149	3516	4059	4271	3387	3798	4116	2602	2563	2563	2563	2563
TOTALS	23249	42984	70326	81195	85434	67742	75974	82321	52046	51270	51270	51270	51270

SOURCE: HDR SCIENCES

CONSTRUCTION MATERIALS (2.5.1)

Procurement of construction materials is not likely to have a significant impact on the economies of the regions of influence defined for this study. Most of these materials would be supplied from outside the Nevada/Utah and Texas/New Mexico deployment regions. The principal materials requirements are for cement, steel, petroleum, oil, lubricants, lumber, sand, and gravel.

Cement. Some of the cement needed to build the DDA and base facilities could be supplied by manufacturers currently or prospectively located in the states containing the potential deployment areas. No manufacturing facilities currently are located within the deployment regions, though several establishments are situated in adjacent areas. Much of this productive capacity would be employed without deploying M-X in either of the study regions, however, so that the incremental output and employment attributable to M-X would be quite small.

Steel. A portion of the steel requirements of the M-X system could be supplied within the four deployment states. Most of the steel, however, would be imported from outside the regions of influence, perhaps from outside of the United States. As a consequence, no significant impact from project steel purchases is expected to occur within the deployment region.

Aggregate. Sand and gravel would be locally available, but probably would be supplied by Air Force construction contractors directly. The labor required to excavate and transport the aggregate is included in the direct employment data presented previously in this report.

Other processed inputs. Petroleum, oil, lubricants, lumber, and other processed construction inputs would largely be supplied from outside the regions of influence. Some economic activity would be induced within the regions as a result of these procurement demands, but the level of such activity is likely to be small.

Construction materials procurement consequently is not treated in this analysis as a significant source of local project demand. The potential impacts of the M-X project on construction resource markets at a broad regional level has been treated elsewhere in the M-X environmental impact analysis process (see Cement and Steel Price Impact Associated with the M-X System, Frank K. Stuart and Associates, Salt Lake City, 14 June 1980).

CONSTRUCTION WORK-FORCE SUPPORT (2.5.2)

No data yet are available on the level and commodity composition of procurement by Air Force construction contractors to support personnel housed in construction camps throughout the deployment regions. This study assumes that the local economic effects of this type of procurement are captured by the payment of subsistence payments to construction workers. Most of this subsistence pay then is assumed to be spent within the region, and is distributed within the regions of influence in the same proportions as the rest of regional construction personnel consumption demands. These assumptions have been discussed previously in this report, along with wage and salary assumptions for construction workers.

OPERATIONS WORK-FORCE SUPPORT (2.5.3)

The value and composition of procurement administered by the M-X operating bases are somewhat uncertain. The best data available at the present time are from six currently operating Minuteman bases and Goodfellow Air Force Base, Texas. Table 2.5-1 presents estimates of operating procurement - both in the aggregate and per base employee - for the six Minuteman bases. More than any other existing military installations, these six bases are similar in mission to the proposed M-X bases. Annual base procurement per worker (in fiscal year 1980 dollars) varies from $2,415 at Malmstrom AFB to $4,652 at Ellsworth AFB. All six bases are located in sparsely populated areas of the upper Great Plains, and hence are in economic and geographic conditions somewhat similar to those of the Great Basin and High Plains. Procurement per worker for these six bases averages about $3,500 per year.

Table 2.5-1 also displays the approximate regional distribution of these procurement expenditures. On the average for all six bases, 30.5 percent of procurement was purchased within the region of influence of the base. An additional 25.4 percent was purchased from the rest of the state, while the remaining 44.1 percent originated in the rest of the United States.

Table 2.5-2 displays the value and commodity composition of base procurement for Goodfellow AFB, Texas. These data are based on a compilation of base records during the process of analyzing the impacts of closing the base. Procurement per worker at Goodfellow was significantly higher than the average for the six Minuteman bases - roughly $5,000 annually compared to $3,500 (fiscal year 1980 dollars). Most of this procurement was concentrated in food products, utilities, and services.

The Goodfellow AFB data are of particular interest because they are consistent with the off-base expenditure patterns assumed in this study (and shown in Table 2.5-3). The relationship between base procurement and off-base expenditures is particularly important, because the higher the propensity to purchase goods from the base commissary and exchange, the lower the share of off-base consumption expenditures and the greater the procurement demands of the base.

The Goodfellow data consequently are given greater weight in this study than the individual Minuteman bases. M-X operations procurement per worker is assumed to be the simple average of Goodfellow and Minuteman procurement estimates - $4,250 per year (fiscal year 1980 dollars).

The average regional distribution for the Minuteman bases is used in this analysis by assuming that 30 percent of procurement is supplied from the localized region of influence of the base, an additional 25 percent originates in the metropolitan areas of the deployment region, and 45 percent is supplied from the rest of the United States.

The commodity composition of operations procurement is assumed to be a simplification of the data for Goodfellow AFB. The commodity composition used in this analysis is shown in Table 2.5-4. The most significant assumption embodied in this distribution concerns food products. These are assumed to be supplied wholly from outside the broad region of influence of the M-X system, though the trade and transportation services associated with food and manufactured products procurement are assumed to be supplied within the broad region of influence.

Table 2.5-1. AFB procurement: total, per-worker, and regional distribution for six Minuteman bases.

AIR FORCE BASE	TOTAL BASE EMPLOYMENT	TOTAL BASE PROCUREMENT CURRENT DOLLAR ($ 000's)	DATE OF PROCUREMENT	TOTAL BASE PROCUREMENT FY-80 DOLLARS[1] ($ 000's)	PROCUREMENT PER WORKER	PERCENTAGE REGIONAL DISTRIBUTION OF PROCUREMENT		
						REGION OF INFLUENCE (%)	REST OF STATE (%)	REST OF U.S. (%)
Ellsworth	5,998	20,898.8	FY-76	27,900.4	4,652	48.3	5.6	46.1
Grand Forks	6,145	19,878.4	FY-77	25,153.3	4,093	32.4	29.8[2]	37.8
Malmstrom	5,971	11,398.3	FY-77	14,422.9	2,415	28.0	33.0	39.0
Minot	7,716	15,659.1	FY-75	22,107.3	2,865	38.0	27.0	35.0
Warren	4,717	12,339.9	FY-75	17,421.3	3,693	22.0	10.0	68.0
Whiteman	3,846	9,835.4	FY-76	13,130.5	3,414	14.4	46.9	38.7
Total or Average	34,393	N.A.	N.A.	120,135.7	3,493[3]	30.5[4]	25.4[4]	44.1[4]

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N.A. = Not Applicable.

[1] Adjusted from current dollar data using the following fiscal year GNP deflators:

FY 1975	125.04
FY 1976	132.23
FY 1977	139.[illegible]
FY 1980	176.53

[2] Includes both North Dakota and Minnesota.

[3] Weighted average (total procurement divided by total employment).

[4] Simple average.

Sources: U.S. Air Force. TAB A-1 Environmental Narrative. Ellsworth AFB, Rapid City, South Dakota. Revised March 1977. Sec. 4.2.4.1, pg. 64.

U.S. Air Force. TAB A-1 Environmental Narrative Phase II. Grand Forks AFB, Emerado, North Dakota. Revised 19 April 1978. Sec. 4.2.4.1, pg. 73.

U.S. Air Force. TAB A-1 Environmental Narrative. Malmstrom AFB, Great Falls, Montana. Revised 15 August 1977. Sec. 4.2.4.1, pg. 4-21.

U.S. Air Force. TAB A-1 Environmental Narrative. Minot AFB, Minot, North Dakota. Revised 15 August 1977. Sec. 4.2.4.1, pg. 60.

U.S. Air Force. TAB A-1 Environmental Narrative Phase II. F.E. Warren AFB, Cheyenne, Wyoming. Revised July 1977. Sec. 4.2.4.1, pg. 83.

U.S. Air Force. Tab A-1 Environmental Narrative Phase II. Whiteman AFB, Knob Noster, Missouri. Revised 10 August 1977. Sec. 4.2.4.1, pg. 86.

Table 2.5-2. Commodity and service procurement data by industry, Goodfellow AFB, Texas, 15 April 1977-15 April 1978.

	INDUSTRY	VALUE OF LOCAL PURCHASES ($000s)	PERCENT OF TOTAL LOCAL PURCHASES
1.	Maintenance and repair of military facilities	483.9	4.6
2.	Food and kindred products	3,166.8	30.0
3.	Apparel and shoes	12.3	0.1
4.	Other fabric products	59.6	0.6
5.	Lumber products	58.4	0.6
6.	Furniture	66.0	0.6
7.	Paper and allied products	112.9	1.1
8.	Printing and publishing	50.2	0.5
9.	Chemicals and allied products	66.8	0.6
10.	Drugs	372.8	3.5
11.	Primary and fabricated metal products	117.2	1.1
12.	Machinery, except electrical	32.9	0.3
13.	Office machinery	176.6	1.7
14.	Electrical machinery	46.2	0.4
15	Household appliances	40.1	0.4
16.	Motor vehicles and parts	29.4	0.3
17.	Other transportation equipment	18.4	0.2
18.	Professional equipment, instruments, photography equipment, etc.	279.4	2.6
19.	Miscellaneous manufacturing	17.2	0.2
20.	Communications	208.5	2.0
21.	Utilities	2,089.9	19.8
22.	Personal services	982.2	9.3
23.	Business services	1,116.7	10.6
24.	Automotive and automotive repair services	89.7	0.8
25.	Miscellaneous repair services	139.2	1.3
26.	Professional services	697.8	6.6
27.	Contract training services	37.4	0.4
	Total	10,568.2	100.0
	Total Full-Time Employees	2,602	
	Procurement Per Employee, Current Dollars	4,062	
	Procurement Per Emp. Yr., FY1980 Dollars	4,985	

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*GNP implicit price deflator, average 1977 II-1978 I = 143.85 (Economic Report of the President, 1980). GNP implicit price deflator, average 1979 IV-1980 III = 176.53 (Chase Econometrics standard forecast of 22 July 1980). Ratio: 176.53 / 143.85 = 1.22718.

Source: U.S. Air Force, Headquarters Air Force Engineering and Services Center, Tyndall AFB, Florida. Personal communication from W. Allen Nixon, economist, 24 July 1980.

Table 2.5-3. Average offbase personal consumption expenditure patterns for all Air Force logistics command bases, 1978.

PERSONNEL	PERCENT OF PERSONAL CONSUMPTION EXPENDITURES OFFBASE
Military	
Onbase Residents	51
Offbase Residents	59
DOD Civilians	88

3974

Source: U.S. Air Force, Headquarters Air Force Engineering and Services Center, Tyndall AFB, Florida, personal communication from W. Allen Nixon, economist, 24 July 1980.

Table 2.5-4. Commodity composition of M-X base operations procurement.

R.I.M.S. SECTOR NUMBER	COMMODITY	PROCUREMENT SHARE (Percent)
72	Maintenance and repair of mil. facilities	7.7
446	Motor freight transportation	4.6
451	Communications	3.1
453	Electric Services	10.3
454	Gas production and distribution	10.3
455	Water supply and sanitary services	10.2
456	Wholesale trade	9.2
457	Retail trade	3.1
466	Personal services	15.4
468	Business services	15.4
470	Professional services	10.8
		100.0

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NOTE: This proportionate distribution shown here relates only to procurement supplied within the region of influence.

Tables 2.5-5 and 2.5-6 show the regional procurement allocation assumptions for the base locations analyzed in this study. These are consistent with the data from the TAB/A-1 Environmental Narratives. For example, a base located at Milford is assumed to purchase 15 percent of its needs from Beaver County, 10 percent from Iron County, and 5 percent from Washington County, a total of 30 percent within the immediate vicinity of the base. An additional 25 percent is procured from Salt Lake and Clark Counties, so that 55 percent is obtained from within the ROI.

Tables 2.5-7 through 2.5-16 display the data on the dollar value of operations procurement demands by county and community which result from these assumptions. Since it is extremely difficult to predict the regional distribution of procurement outlays by sector, the sectoral composition of total procurement expenditures (shown in Tables 2.5-7 through 2.5-16) in each county is assumed to be that shown in Table 2.5-4. The result of this assumption is to allocate a representative mix of procurement demands to each of the affected counties.

2.6 PROJECT-RELATED INVESTMENT

Construction and operation of the base and DDA facilities and the changes in local employment and population associated with the project will require substantial investments in local infrastructure. Some of these investments will be spread broadly over the deployment region, as would be the case for highway improvements near DDA facilities. For the most part, however, these expenditures would be concentrated in the communities nearest the operating base locations.

Some of this investment would be public, while the rest would be at the discretion of the private sector. Since these investments themselves have secondary multiplier effects, the level of project-related investment determines and is determined by the extent of employment and population expansion indirectly related to the project. This analysis therefore uses preliminary assumptions about total project-related population and employment growth to estimate local investment demand.

Project-related investment has been estimated for eight different categories: offbase housing, street facilities, school facilities, other public buildings, public and private utilities, retail buildings, commercial buildings, and industrial buildings. Some construction is implicit in the RIMS multiplier estimates of indirect output, though the extent of this endogenous construction demand probably is not sufficient to capture the effects of large-scale construction. These investment demands consequently enter the analysis as exogenous changes in final demand for a number of construction sectors.

Tables 2.6-1 and 2.6-2 present the data used in the analysis regarding local project-related investment. These estimates are specific to the size of the bases, as well as to the fraction of military personnel and their dependents assumed to be living offbase. All dollar values are in FY 1980 dollars assuming an 18.5 percent increase in construction costs from 1978 to FY 1980, based on the change in the implicit price deflator for gross private domestic investment in nonfarm residential structures. A plausible time path for each of the eight investment categories also was incorporated into the analysis, and is shown in the tables. Appendix C contains the assumptions and computations used in deriving these data.

Table 2.5-5. Regional allocation assumptions for base procurement expenditures, Nevada/ Utah (percent).

COUNTY	BASE LOCATION				
	COYOTE SPRING	MILFORD	BERYL	DELTA	ELY
Clark, Nevada	50	10	15	—	10
Washoe, Nevada	—	—	—	—	5
Salt Lake/Utah, Utah	—	15	10	25	10
Beaver, Utah	—	15	5	—	—
Iron, Utah	—	10	15	5	—
White Pine, Nevada	—	—	—	—	30
Washington, Utah	5	5	10	—	—
Millard, Utah	—	—	—	20	—
Juab, Utah	—	—	—	5	—
Rest of U.S.	45	45	45	45	45
Total	100	100	100	100	100

3976

Source: HDR Sciences.

TABLE 2.5-6. COMMUNITY SHARES IN REGIONAL BASE PROCUREMENT EXPENDITURES
TEXAS/NEW MEXICO
(PERCENT)

COMMUNITY	BASE LOCATION	
	CLOVIS, NM	DALHART, TX
POTTER/RANDALL COS (AMARILLO TX)	0.11	0.20
MOORE CO , TX (DUMAS)		0.04
DALLAM CO , TX (DALHART)		0.13
HARTLEY CO , TX (HARTLEY/DALHART)		0.13
LUBBOCK CO , TX (LUBBOCK)	0.11	0.05
CURRY CO , NM (CLOVIS)	0.25	
ROOSEVELT CO , NM (PORTALES)	0.05	
CHAVES CO , NM (ROSWELL)	0.03	

SOURCE: HDR SCIENCES

TABLE 2.5-7. OPERATIONS PROCUREMENT PER COMMUNITY — PROPOSED ACTION

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO., NEV. (LAS VEGAS)	0	0	2656	5312	8563	11815	15087	18359	18359	18359	18359	18359	18359
WASHOE CO., NEV (RENO)	0	0	0	0	0	0	0	0	0	0	0	0	0
SALT LAKE CO., UT (SALT LAKE CITY)	0	0	0	0	892	1785	2709	3633	3633	3633	3633	3633	3633
BEAVER CO., UT (MILFORD)	0	0	0	0	892	1785	2709	3633	3633	3633	3633	3633	3633
IRON CO., UT (BERYL/CEDAR CITY)	0	0	0	0	595	1190	1806	2422	2422	2422	2422	2422	2422
LINCOLN CO., NEV (CALIENTE&VICINITY)	0	0	0	0	0	0	0	0	0	0	0	0	0
WHITE PINE CO., NEV (ELY&VICINITY)	0	0	0	0	0	0	0	0	0	0	0	0	0
WASHINGTON CO., UT (ST. GEORGE)	0	0	265	531	1093	1657	2231	2804	2804	2804	2804	2804	2804
TOTALS	0	0	2921	5843	12035	18232	24542	30851	30851	30851	30851	30851	30851

SOURCE: HDR SCIENCES, SEE TABLES 2.5-1 THROUGH 2.5-6.

TABLE 2.5-8. OPERATIONS PROCUREMENT PER COMMUNITY

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(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO ,NEV (LAS VEGAS)	0	0	2656	5312	8860	12410	15990	19570	19570	19570	19570	19570	19570
WASHOE CO ,NEV (RENO)	0	0	0	0	0	0	0	0	0	0	0	0	0
SALT LAKE CO ,UT (SALT LAKE CITY)	0	0	0	0	595	1190	1806	2422	2422	2422	2422	2422	2422
BEAVER CO ,UT (MILFORD)	0	0	0	0	297	595	903	1211	1211	1211	1211	1211	1211
IRON CO ,UT (BERYL/CEDAR CITY)	0	0	0	0	892	1785	2709	3633	3633	3633	3633	3633	3633
LINCOLN CO ,NEV (CALIENTE&VICINITY)	0	0	0	0	0	0	0	0	0	0	0	0	0
WHITE PINE CO ,NEV (ELY&VICINITY)	0	0	0	0	0	0	0	0	0	0	0	0	0
WASHINGTON CO ,UT (ST GEORGE)	0	0	265	531	1391	2252	3134	4015	4015	4015	4015	4015	4015
TOTALS	0	0	2921	5843	12035	18232	24542	30851	30851	30851	30851	30851	30851

SOURCE: HDR SCIENCES. SEE TABLES 2.5-1 THROUGH 2.5-6.

ALTERNATIVE 2

TABLE 2.5-9. OPERATIONS PROCUREMENT PER COMMUNITY

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO ,NEV (LAS VEGAS)	0	0	2656	5312	7968	10625	13281	15937	15937	15937	15937	15937	15937
LINCOLN CO , NV (CALIENTE & VIC)	0	0	0	0	0	0	0	0	0	0	C	0	0
MILLARD CO , UT (DELTA & VIC)	0	0	0	0	1190	2380	3612	4845	4845	4845	4845	4845	4845
JUAB CO., UT (EUREKA & NEPHI)	0	0	0	0	297	595	903	1211	1211	1211	1211	1211	1211
SALT LAKE/UTAH, UT	0	0	0	0	1487	2975	4515	6056	6056	6056	6056	6056	6056
WASHINGTON CO , UT (ST GEORGE)	0	0	265	531	796	1062	1328	1593	1593	1593	1593	1593	1593
IRON CO., UT (BERYL)	0	0	0	0	297	595	903	1211	1211	1211	1211	1211	1211
TOTALS	0	0	2921	5843	12035	18232	24542	30853	30853	30853	30853	30853	30853

SOURCE: HDR SCIENCES. SEE TABLES 2.5-1 THROUGH 2.5-6.

ALTERNATIVE 3

TABLE 2.5-10. OPERATIONS PROCUREMENT PER COMMUNITY

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO ,NEV (LAS VEGAS)	0	0	796	1593	2985	4377	5790	7203	7203	7203	7203	7203	7203
WASHOE CO ,NEV (RENO)	0	0	0	0	297	595	903	1211	1211	1211	1211	1211	1211
SALT LAKE CO ,UT (SALT LAKE CITY)	0	0	531	1062	2188	3315	4462	5609	5609	5609	5609	5609	5609
BEAVER CO ,UT (MILFORD)	0	0	265	531	796	1062	1328	1593	1593	1593	1593	1593	1593
IRON CO ,UT (BERYL/CEDAR CITY)	0	0	796	1593	2390	3187	3984	4781	4781	4781	4781	4781	4781
LINCOLN CO ,NEV (CALIENTE&VICINITY)	0	0	0	0	0	0	0	0	0	0	0	0	0
WHITE PINE CO ,NEV (ELY&VICINITY)	0	0	0	0	1785	3570	5418	7267	7267	7267	7267	7267	7267
WASHINGTON CO ,UT (ST GEORGE)	0	0	531	1062	1593	2125	2656	3187	3187	3187	3187	3187	3187
TOTALS	0	0	2919	5841	12034	18231	24541	30851	30851	30851	30851	30851	30851

SOURCE: HDR SCIENCES. SEE TABLES 2.5-1 THROUGH 2.5-6.

ALTERNATIVE 4

TABLE 2.5-11. OPERATIONS PROCUREMENT PER COMMUNITY

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO ,NEV (LAS VEGAS)	0	0	796	1593	5365	9137	13015	16893	16893	16893	16893	16893	16893
WASHOE CO ,NEV (RENO)	0	0	0	0	0	0	0	0	0	0	0	0	0
SALT LAKE CO ,UT (SALT LAKE CITY)	0	0	531	1062	1593	2125	2656	3187	3187	3187	3187	3187	3187
BEAVER CO ,UT (MILFORD)	0	0	265	531	796	1062	1328	1593	1593	1593	1593	1593	1593
IRON CO ,UT (BERYL/CEDAR CITY)	0	0	796	1593	2390	3187	3984	4781	4781	4781	4781	4781	4781
LINCOLN CO ,NEV (CALIENTE&VICINITY)	0	0	0	0	0	0	0	0	0	0	0	0	0
WHITE PINE CO ,NEV (ELY&VICINITY)	0	0	0	0	0	0	0	0	0	0	0	0	0
WASHINGTON CO ,UT (ST GEORGE)	0	0	531	1062	1890	2720	3559	4398	4398	4398	4398	4398	4398
TOTALS	0	0	2919	5641	12034	18231	24542	30852	30852	30852	30852	30852	30852

SOURCE: HDR SCIENCES. SEE TABLES 2.5-1 THROUGH 2.5-6.

ALTERNATIVE 5

TABLE 2.5-12. OPERATIONS PROCUREMENT PER COMMUNITY

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO., NEV. (LAS VEGAS)	0	0	531	1062	2188	3315	4462	5609	5609	5609	5609	5609	5609
WASHOE CO., NEV (RENO)	0	0	0	0	297	595	903	1211	1211	1211	1211	1211	1211
SALT LAKE CO., UT (SALT LAKE CITY)	0	0	796	1593	2985	4377	5790	7203	7203	7203	7203	7203	7203
BEAVER CO., UT (MILFORD)	0	0	796	1593	2390	3187	3984	4781	4781	4781	4781	4781	4781
IRON CO., UT (BERYL/CEDAR CITY)	0	0	531	1062	1593	2125	2656	3187	3187	3187	3187	3187	3187
LINCOLN CO., NEV (CALIENTE&VICINITY)	0	0	0	0	0	0	0	0	0	0	0	0	0
WHITE PINE CO., NEV (ELY&VICINITY)	0	0	0	0	1785	3570	5418	7267	7267	7267	7267	7267	7267
WASHINGTON CO., UT (ST GEORGE)	0	0	265	531	796	1062	1328	1593	1593	1593	1593	1593	1593
TOTALS	0	0	2919	5841	12034	18231	24541	30851	30851	30851	30851	30851	30851

SOURCE: HDR SCIENCES. SEE TABLES 2.5-1 THROUGH 2.5-6.

ALTERNATIVE 6

TABLE 2.5-13. OPERATIONS PROCUREMENT PER COMMUNITY

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO ,NEV (LAS VEGAS)	0	0	531	1062	4568	8075	11687	15299	15299	15299	15299	15299	15299
WASHOE CO ,NEV (RENO)	0	0	0	0	0	0	0	0	0	0	0	0	0
SALT LAKE CO ,UT (SALT LAKE CITY)	0	0	796	1593	2390	3187	3984	4781	4781	4781	4781	4781	4781
BEAVER CO ,UT (MILFORD)	0	0	796	1593	2390	3187	3984	4781	4781	4781	4781	4781	4781
IRON CO ,UT (BERYL/CEDAR CITY)	0	0	531	1062	1593	2125	2656	3187	3187	3187	3187	3187	3187
LINCOLN CO ,NEV (CALIENTE&VICINITY)	0	0	0	0	0	0	0	0	0	0	0	0	0
WHITE PINE CO ,NEV (ELY&VICINITY)	0	0	0	0	0	0	0	0	0	0	0	0	0
WASHINGTON CO ,UT (ST GEORGE)	0	0	265	531	1073	1657	2231	2804	2804	2804	2804	2804	2804
TOTALS	0	0	2919	5841	12034	18231	24542	30852	30852	30852	30852	30852	30852

SOURCE: HDR SCIENCES. SEE TABLES 2.5-1 THROUGH 2.5-6.

TABLE 2.5-14: OPERATIONS PROCUREMENT PER COMMUNITY — ALTERNATIVE 7

(THOUSANDS OF FY 1990 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
POTTER/RANDALL COS (AMARILLO TX)	0	0	584	1168	2643	4717	6593	8351	8351	8351	8351	8351	8351
MOORE CO., TX (DUMAS)	0	0	0	0	238	476	722	969	969	969	969	969	969
DALLAM CO., TX (DALHART)	0	0	0	0	773	1547	2348	3149	3149	3149	3149	3149	3149
HARTLEY CO., TX (HARTLEY/DALHART)	0	0	0	0	773	1547	2348	3149	3149	3149	3149	3149	3149
LUBBOCK CO., TX (LUBBOCK)	0	0	584	1168	2050	2932	3824	4717	4717	4717	4717	4717	4717
CURRY CO., NM (CLOVIS)	0	0	1328	2656	3984	5312	6640	7968	7968	7968	7968	7968	7968
ROOSEVELT CO., NM (PORTALES)	0	0	265	531	796	1062	1328	1593	1593	1593	1593	1593	1593
CHAVES CO., NM (ROSWELL)	0	0	159	318	478	637	796	956	956	956	956	956	956
TOTALS	0	0	2920	5841	12035	18230	24539	30852	30852	30852	30852	30852	30852

SOURCE: HDR SCIENCES. SEE TABLES 2.5-1 THROUGH 2.5-6.

TABLE 2.5-15. OPERATIONS PROCUREMENT PER COMMUNITY ALTERNATIVE 8A

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK CO., NEV (LAS VEGAS)	0	0	2656	5206	7862	10518	13281	15725	15725	15725	15725	15725	15725
LINCOLN CO., NV (CALIENTE & VIC)	0	0	0	0	0	0	0	0	0	0	0	0	0
MILLARD CO., UT (DELTA & VIC)	0	0	0	0	0	0	0	0	0	0	0	0	0
JUAB CO., UT (EUREKA & NEPHI)	0	0	0	0	0	0	0	0	0	0	0	0	0
SALT LAKE/UTAH, UT	0	0	0	0	0	0	0	0	0	0	0	0	0
WASHINGTON CO., UT (ST GEORGE)	0	0	265	520	786	1051	1328	1572	1572	1572	1572	1572	1572
IRON CO., UT (BERYL)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	0	0	2921	5726	8648	11569	14609	17297	17297	17297	17297	17297	17297

SOURCE: HDR SCIENCES. SEE TABLES 2.5-1 THROUGH 2.5-6.

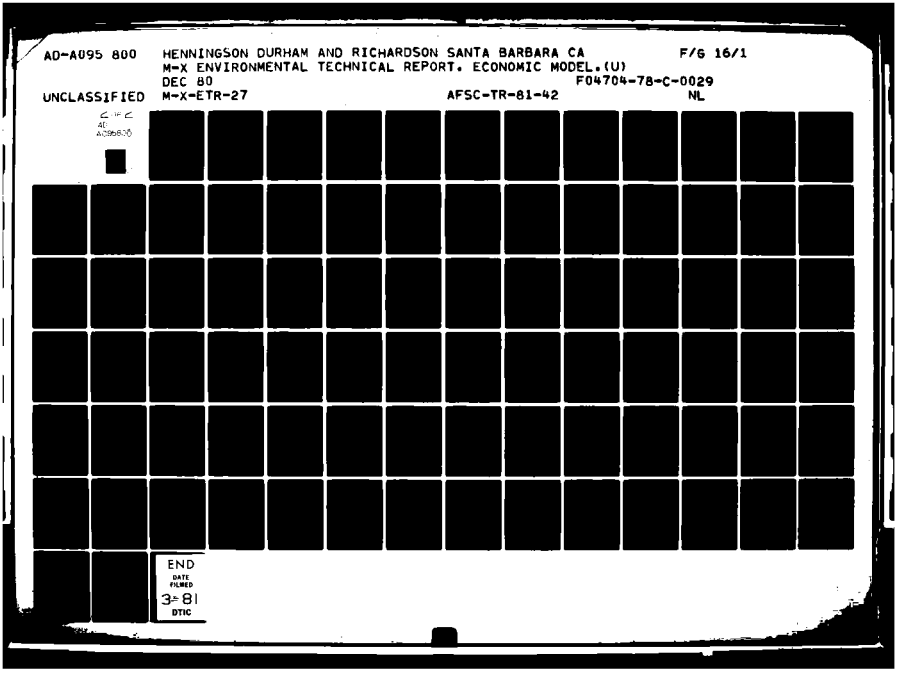
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TABLE 2.5-16. OPERATIONS PROCUREMENT PER COMMUNITY

ALTERNATIVE 5B

(THOUSANDS OF FY 1980 $)

COUNTY & COMMUNITY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
POTTER/RANDALL COS. (AMARILLO TX.)	0	0	584	1145	1729	2314	2921	3459	3459	3459	3459	3459	3459
MOORE CO., TX (DUMAS)	0	0	0	0	0	0	0	0	0	0	0	0	0
DALLAM CO., TX (DALHART)	0	0	0	0	0	0	0	0	0	0	0	0	0
HARTLEY CO., TX (HARTLEY/DALHART)	0	0	0	0	0	0	0	0	0	0	0	0	0
LUBBOCK CO., TX (LUBBOCK)	0	0	584	1145	1729	2314	2921	3459	3459	3459	3459	3459	3459
CURRY CO., NM (CLOVIS)	0	0	1328	2603	3931	5259	6640	7862	7862	7862	7862	7862	7862
ROOSEVELT CO., NM (PORTALES)	0	0	265	520	786	1051	1328	1572	1572	1572	1572	1572	1572
CHAVES CO., NM (ROSWELL)	0	0	159	312	471	631	796	943	943	943	943	943	943
TOTALS	0	0	2920	5725	8646	11569	14606	17295	17295	17295	17295	17295	17295

SOURCE: HDR SCIENCES. SEE TABLES 2.5-1 THROUGH 2.5-6.

TABLE 2.6-1. M-X BASE COMMUNITY RELATED INVESTMENT ASSUMPTIONS
BASE I : THOUSANDS OF FISCAL YEAR 1980 DOLLARS

INVESTMENT CATEGORY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
60 PERCENT ONBASE													
OFFBASE HOUSING	13642.	27282.	40924.	54565.	54565.	40924.	40924.	0.	0.	0.	0.	0.	0.
STREET FACILITIES	3849.	7698.	7698.	7698.	7698.	3849.	0.	0.	0.	0.	0.	0.	0.
SCHOOL FACILITIES	0.	0.	6252.	6252.	12504.	6252.	0.	0.	0.	0.	0.	0.	0.
OTHER PUBLIC BLDGS	0.	0.	0.	3528.	3528.	0.	0.	0.	0.	0.	0.	0.	0.
UTILITIES	7548.	15096.	15096.	15096.	15096.	7548.	0.	0.	0.	0.	0.	0.	0.
RETAIL BUILDINGS	0.	5033.	10065.	20131.	5033.	10065.	0.	0.	0.	0.	0.	0.	0.
COMMERCIAL BUILDINGS	0.	2338.	4675.	4675.	4675.	4675.	2338.	0.	0.	0.	0.	0.	0.
INDUSTRIAL BUILDINGS	0.	0.	0.	0.	2370.	2370.	4740.	2370.	0.	0.	0.	0.	0.
80 PERCENT ONBASE													
OFFBASE HOUSING	10498.	20996.	31493.	41990.	41990.	31493.	31493.	0.	0.	0.	0.	0.	0.
STREET FACILITIES	2960.	5920.	5920.	5920.	5920.	2960.	0.	0.	0.	0.	0.	0.	0.
SCHOOL FACILITIES	0.	0.	4881.	4881.	9762.	4881.	0.	0.	0.	0.	0.	0.	0.
OTHER PUBLIC BLDGS	0.	0.	0.	3143.	3143.	0.	0.	0.	0.	0.	0.	0.	0.
UTILITIES	5806.	11613.	11613.	11613.	5806.	5806.	5806.	0.	0.	0.	0.	0.	0.
RETAIL BUILDINGS	0.	5033.	10065.	20131.	5033.	10065.	0.	0.	0.	0.	0.	0.	0.
COMMERCIAL BUILDINGS	0.	2338.	4675.	4675.	4675.	4675.	2338.	0.	0.	0.	0.	0.	0.
INDUSTRIAL BUILDINGS	0.	0.	0.	0.	2370.	2370.	4740.	2370.	0.	0.	0.	0.	0.
100 PERCENT ONBASE													
OFFBASE HOUSING	7327.	14654.	21981.	29307.	29307.	21981.	21981.	0.	0.	0.	0.	0.	0.
STREET FACILITIES	2065.	4131.	4131.	4131.	4131.	2065.	0.	0.	0.	0.	0.	0.	0.
SCHOOL FACILITIES	0.	0.	3522.	3522.	7044.	3522.	0.	0.	0.	0.	0.	0.	0.
OTHER PUBLIC BLDGS	0.	0.	0.	2797.	2797.	0.	0.	0.	0.	0.	0.	0.	0.
UTILITIES	4053.	8105.	8105.	8105.	4053.	4053.	4053.	0.	0.	0.	0.	0.	0.
RETAIL BUILDINGS	0.	5033.	10065.	20131.	5033.	10065.	0.	0.	0.	0.	0.	0.	0.
COMMERCIAL BUILDINGS	0.	2338.	4675.	4675.	4675.	4675.	2338.	0.	0.	0.	0.	0.	0.
INDUSTRIAL BUILDINGS	0.	0.	0.	0.	2370.	2370.	4740.	2370.	0.	0.	0.	0.	0.

Source: HDR Sciences. SEE APPENDIX C.

TABLE 2.6-2. M-X BASE COMMUNITY RELATED INVESTMENT ASSUMPTIONS
BASE II: THOUSANDS OF FISCAL YEAR 1980 DOLLARS

INVESTMENT CATEGORY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
60 PERCENT ONBASE													
OFFBASE HOUSING	0	0.	10051.	20102.	30155.	40206.	40206.	30155.	30155.	0.	0.	0.	0
STREET FACILITIES	0	0	2836.	5673.	5673.	5673.	5673.	2836	0.	0.	0	0.	0.
SCHOOL FACILITIES	0	0.	0.	0.	4607	4607.	9215.	4607.	0.	0.	0	0.	0.
OTHER PUBLIC BLDGS	0	0.	0.	0.	0.	2600.	2600.	0.	0.	0.	0.	0.	0.
UTILITIES	0.	0.	5561.	11124.	11124.	11124.	5561.	5561.	5561.	0.	0.	0.	0.
RETAIL BUILDINGS	0.	0.	0.	3708.	7417.	14834.	3708.	7417.	0.	0.	0.	0.	0.
COMMERCIAL BUILDINGS	0.	0.	0.	1723.	3445.	3445.	3445.	3445.	1723.	0.	0.	0.	0.
INDUSTRIAL BUILDINGS	0.	0.	0.	0.	0.	0.	2370.	2370.	2370.	2370.	0.	0.	0.
80 PERCENT ONBASE													
OFFBASE HOUSING	0.	0.	7736.	15470.	23206.	30940.	30940.	23206.	23206.	0	0.	0.	0.
STREET FACILITIES	0.	0.	2182.	4362.	4362.	4362.	4362.	2182.	0.	0.	0.	0.	0.
SCHOOL FACILITIES	0.	0.	0.	0.	3996.	3996.	7193.	3996.	0.	0.	0.	0.	0.
OTHER PUBLIC BLDGS	0.	0.	0.	0.	0.	2315.	2315.	0.	0.	0.	0.	0.	0.
UTILITIES	0.	0.	4279.	8558.	8558.	8558.	8558.	8558.	4279.	0.	0.	0.	0.
RETAIL BUILDINGS	0.	0.	0.	3708.	7417.	14834.	3708.	7417.	0.	0.	0	0.	0.
COMMERCIAL BUILDINGS	0.	0.	0.	1723.	3445.	3445.	3445.	3445.	1723.	0.	0.	0.	0.
INDUSTRIAL BUILDINGS	0.	0.	0.	0.	0.	0.	2370.	2370.	2370.	2370.	0.	0.	0.
100 PERCENT ONBASE													
OFFBASE HOUSING	0.	0.	5399.	10798.	16197.	21595.	21595.	16197.	16197.	0.	0.	0.	0.
STREET FACILITIES	0.	0.	1523.	3044.	3044.	3044.	3044.	1523.	0.	0.	0.	0.	0.
SCHOOL FACILITIES	0.	0.	0.	0.	2595.	2595.	5190.	2595.	0.	0.	0.	0.	0.
OTHER PUBLIC BLDGS	0.	0.	0.	0.	0.	2032.	2032.	0.	0.	0.	0.	0.	0.
UTILITIES	0	0.	2986.	5972.	5972.	5972.	2986.	2986.	2986.	0.	0.	0.	0.
RETAIL BUILDINGS	0.	0.	0.	3708.	7417.	14834.	3708.	7417.	0.	0.	0.	0.	0.
COMMERCIAL BUILDINGS	0.	0.	0.	1723.	3445.	3445.	3445.	3445.	1723.	0.	0.	0.	0.
INDUSTRIAL BUILDINGS	0.	0.	0.	0.	0.	0.	2370.	2370.	2370.	2370.	0.	0.	0.

Source: HDR Sciences. SEE APPENDIX C.

3.0 COUNTY-LEVEL INTERINDUSTRY MODELS

The indirect and induced effects of project-related changes in final demand within the study region are analyzed using county-level interindustry models derived from a modified version of the Regional Industrial Multiplier System (R.I.M.S.). This analysis yields estimates of total M-X-related earnings and employment by place of employment.

A more detailed exposition of the logic and assumptions underlying the Regional Industrial Multiplier System appears as Appendix D to this report.

3.1 R.I.M.S. MULTIPLIERS: MODIFIED AND UNMODIFIED

Tables 3.1-1 through 3.1-4 present the unmodified estimated R.I.M.S. multipliers used in this analysis.

The Regional Industrial Multiplier System, originally developed at the Bureau of Economic Analysis, U.S. Department of Commerce, estimates industry-specific gross-output multipliers for any county or group of counties in the United States. As a general rule, these multipliers are estimated from the table of direct requirements for the U.S. economy by adjusting these requirements to the county or regional level using employment-based location quotients. For this analysis, this general procedure was modified to account for probable changes in local economic structure resulting from the project.

The location quotients in the industries most likely to be affected by the project were increased whenever their unmodified values were judged to be too low. The net effect of these modifications is to raise the multipliers for the county in question. Table 3.1-5 indicates the industries for which location quotients were increased. These changes in location quotients affect the multiplier estimates for each industry in the county, including those directly impacted by M-X final demands.

The judgmental changes in location quotients were based on comparisons to other regions which currently contain Air Force bases. One of these bases - Cannon Air Force Base, in Curry County, New Mexico - is in the Texas/New Mexico study region, while the others are outside the areas analyzed. Comparisons were made to location quotients calculated for the regions containing Cannon and Holloman AFBs in New Mexico. These comparisons are presented in the accompanying table. In addition, estimates of local economic structure, based on shares of employment by major industrial sector, for existing Minuteman bases were used to inform these judgemental changes.

These modifications produced small but measurable increases in key multipliers. In White Pine County, Nevada, for example, the unmodified R.I.M.S. multiplier for personal consumption expenditures is 1.59, while the modified multiplier has a value of 1.81, a 14 percent increase. Tables 3.1-6 through 3.1-9 present the modified multipliers used in this study.

3.2 INDIRECT AND INDUCED GROSS OUTPUT, EARNINGS, AND EMPLOYMENT

Given a change in sectoral final demand and that industry's estimated multiplier, the change in regional gross output is simply the product of the multiplier and the final demand change. These computations are performed for each

TABLE 3.1-1. UNMODIFIED R.I.M.S. MULTIPLIERS USED IN THE M-X ECONOMIC IMPACT ANALYSIS: NEVADA

SECTOR	CLARK	EUREKA	LINCOLN	NYE	WHITE PINE
PAYROLL EXPENDITURES	2.23	1.16	1.52	1.28	1.59
MAINT AND REPAIR OF MIL. FACILITIES	2.42	1.68	1.82	1.90	1.78
MOTOR FREIGHT TRANSPORTATION	2.56	1.70	1.99	2.00	1.91
COMMUNICATIONS	2.32	1.63	1.76	1.93	1.73
ELECTRIC SERVICES	2.00	1.31	1.57	1.52	1.51
GAS PRODUCTION AND DISTRIBUTION	2.09	1.20	1.54	1.66	1.40
WATER SUPPLY AND SANITARY SERVICES	2.10	1.41	1.65	1.71	1.56
WHOLESALE TRADE	2.40	1.60	1.80	1.89	1.78
RETAIL TRADE	2.57	1.72	1.86	2.00	1.87
PERSONAL SERVICES	2.50	1.57	1.78	1.88	1.79
BUSINESS SERVICES	2.69	1.71	1.94	2.08	1.89
PROFESSIONAL SERVICES	2.83	1.81	2.02	2.18	1.99
OFFBASE HOUSING	2.93	N.A.	N.A.	N.A.	1.78
STREET FACILITIES	2.66	N.A.	N.A.	N.A.	1.76
SCHOOL FACILITIES	2.44	N.A.	N.A.	N.A.	1.79
OTHER PUBLIC BUILDINGS	2.48	N.A.	N.A.	N.A.	1.79
UTILITIES	2.13	N.A.	N.A.	N.A.	1.72
RETAIL BUILDINGS	2.25	N.A.	N.A.	N.A.	1.73
COMMERCIAL BUILDINGS	2.44	N.A.	N.A.	N.A.	1.78
INDUSTRIAL BUILDINGS	2.15	N.A.	N.A.	N.A.	1.63

N.A. = NOT APPLICABLE

SOURCE: REGIONAL INDUSTRIAL MULTIPLIER SYSTEM, HDR SCIENCES.

TABLE 3.1-2. UNMODIFIED R I M S MULTIPLIERS USED IN THE M-X ECONOMIC IMPACT ANALYSIS: UTAH

SECTOR	BEAVER	IRON	JUAB	MILLARD	S. LAKE /UTAH	WASH.
PAYROLL EXPENDITURES	1.71	1.79	1.65	1.69	2.63	2.05
MAINT. AND REPAIR OF MIL. FACILITIES	1.82	1.96	1.83	1.82	3.25	2.21
MOTOR FREIGHT TRANSPORTATION	1.94	2.07	1.90	2.01	3.01	2.36
COMMUNICATIONS	1.78	1.88	1.73	1.76	3.22	1.95
ELECTRIC SERVICES	1.46	1.66	1.43	1.47	2.87	1.87
GAS PRODUCTION AND DISTRIBUTION	1.27	1.38	1.25	1.25	1.76	1.98
WATER SUPPLY AND SANITARY SERVICES	1.61	1.70	1.58	1.62	1.96	1.82
WHOLESALE TRADE	1.81	1.93	1.76	1.82	2.71	2.
RETAIL TRADE	1.90	2.04	1.84	1.92	2.69	2
PERSONAL SERVICES	1.88	1.99	1.82	1.84	2.73	2.20
BUSINESS SERVICES	1.96	2.10	1.87	1.96	2.86	2.26
PROFESSIONAL SERVICES	2.06	2.18	1.98	2.03	2.97	2.30
OFFBASE HOUSING	1.91	N.A.	N.A.	1.82	2.97	N.A.
STREET FACILITIES	1.98	N.A.	N.A.	1.89	2.55	N.A.
SCHOOL FACILITIES	1.85	N.A.	N.A.	1.71	2.68	N.A.
OTHER PUBLIC BUILDINGS	1.84	N.A.	N.A.	1.71	2.97	N.A.
UTILITIES	1.79	N.A.	N.A.	1.67	2.84	N.A.
RETAIL BUILDINGS	1.79	N.A.	N.A.	1.67	2.56	N.A.
COMMERCIAL BUILDINGS	1.82	N.A.	N.A.	1.71	2.38	N.A.
INDUSTRIAL BUILDINGS	1.66	N.A.	N.A.	1.39	2.83	N.A.

N.A. = NOT APPLICABLE

SOURCE: REGIONAL INDUSTRIAL MULTIPLIER SYSTEM, HDR SCIENCES.

TABLE 3.1-3. UNMODIFIED R I M S MULTIPLIERS USED IN THE M-X ECONOMIC IMPACT ANALYSIS: TEXAS

SECTOR	BAILEY	CASTRO	COCHRAN	DALLAM	DEAF SMITH	HALE	HARTLEY	HOCKLEY	LAMB	LUBBOCK	MOORE
PAYROLL EXPENDITURES	1.73	1.52	1.60	1.73	1.73	1.90	1.44	1.81	1.68	2.31	2.36
MAINT AND REPAIR OF MIL. FACILITIES	1.84	1.73	1.82	1.82	1.81	2.01	1.61	2.02	1.79	2.37	2.00
MOTOR FREIGHT TRANSPORTATION	1.98	1.94	1.96	1.95	2.03	2.20	1.69	2.33	2.03	2.64	2.28
COMMUNICATIONS	1.77	1.65	1.76	1.76	1.74	1.82	1.54	1.92	1.73	1.87	1.70
ELECTRIC SERVICES	1.62	1.44	1.62	1.61	1.55	1.69	1.39	1.71	1.54	1.55	1.70
GAS PRODUCTION AND DISTRIBUTION	1.62	1.22	2.08	1.78	1.25	1.35	1.17	1.65	1.44	1.97	1.63
WATER SUPPLY AND SANITARY SERVICES	1.66	1.52	1.58	1.59	1.61	1.74	1.41	1.82	1.62	2.27	1.81
WHOLESALE TRADE	1.82	1.71	1.81	1.83	1.80	1.91	1.57	2.00	1.81	2.41	1.99
RETAIL TRADE	1.90	1.76	1.89	1.92	1.89	1.98	1.62	2.06	1.89	1.80	2.07
PERSONAL SERVICES	1.85	1.73	1.86	1.85	1.85	1.98	1.58	2.01	1.86	2.37	2.02
BUSINESS SERVICES	1.93	1.82	1.95	1.95	1.92	2.03	1.63	2.11	1.94	2.52	2.12
PROFESSIONAL SERVICES	1.99	1.85	2.01	2.05	1.98	2.08	1.69	2.19	2.01	2.57	2.21
OFFBASE HOUSING	N.A.	N.A.	N.A.	1.90	N.A.	N.A.	1.65	N.A.	N.A.	N.A.	N.A.
STREET FACILITIES	N.A.	N.A.	N.A.	1.97	N.A.	N.A.	1.73	N.A.	N.A.	N.A.	N.A.
SCHOOL FACILITIES	N.A.	N.A.	N.A.	1.84	N.A.	N.A.	1.52	N.A.	N.A.	N.A.	N.A.
OTHER PUBLIC BUILDINGS	N.A.	N.A.	N.A.	1.84	N.A.	N.A.	1.54	N.A.	N.A.	N.A.	N.A.
UTILITIES	N.A.	N.A.	N.A.	1.74	N.A.	N.A.	1.54	N.A.	N.A.	N.A.	N.A.
RETAIL BUILDINGS	N.A.	N.A.	N.A.	1.75	N.A.	N.A.	1.54	N.A.	N.A.	N.A.	N.A.
COMMERCIAL BUILDINGS	N.A.	N.A.	N.A.	1.82	N.A.	N.A.	1.55	N.A.	N.A.	N.A.	N.A.
INDUSTRIAL BUILDINGS	N.A.	N.A.	N.A.	1.65	N.A.	N.A.	1.48	N.A.	N.A.	N.A.	N.A.

N.A. = NOT APPLICABLE

SECTOR	OLDHAM	PARMER	POTTER/ RANDALL	SHERMAN	SWISHER
PAYROLL EXPENDITURES	1.51	1.56	2.36	1.51	1.62
MAINT AND REPAIR OF MIL. FACILITIES	1.81	1.74	2.39	1.70	1.75
MOTOR FREIGHT TRANSPORTATION	1.95	1.96	2.70	1.91	1.95
COMMUNICATIONS	1.69	1.68	2.18	1.63	1.67
ELECTRIC SERVICES	1.50	1.49	2.10	1.53	1.51
GAS PRODUCTION AND DISTRIBUTION	1.23	1.24	2.61	1.68	1.23
WATER SUPPLY AND SANITARY SERVICES	1.53	1.56	2.00	1.53	1.56
WHOLESALE TRADE	1.76	1.74	2.31	1.68	1.72
RETAIL TRADE	1.80	1.79	2.42	1.72	1.76
PERSONAL SERVICES	1.75	1.77	2.46	1.68	1.76
BUSINESS SERVICES	1.88	1.85	2.53	1.75	1.80
PROFESSIONAL SERVICES	1.96	1.90	2.60	1.82	1.86
OFFBASE HOUSING	N.A.	N.A.	N.A.	N.A.	N.A.
STREET FACILITIES	N.A.	N.A.	N.A.	N.A.	N.A.
SCHOOL FACILITIES	N.A.	N.A.	N.A.	N.A.	N.A.
OTHER PUBLIC BUILDINGS	N.A.	N.A.	N.A.	N.A.	N.A.
UTILITIES	N.A.	N.A.	N.A.	N.A.	N.A.
RETAIL BUILDINGS	N.A.	N.A.	N.A.	N.A.	N.A.
COMMERCIAL BUILDINGS	N.A.	N.A.	N.A.	N.A.	N.A.
INDUSTRIAL BUILDINGS	N.A.	N.A.	N.A.	N.A.	N.A.

N.A. = NOT APPLICABLE

SOURCE: REGIONAL INDUSTRIAL MULTIPLIER SYSTEM, HDR SCIENCES.

TABLE 3.1-4. UNMODIFIED R. I. M. S. MULTIPLIERS USED IN THE M-X ECONOMIC IMPACT ANALYSIS: NEW MEXICO

SECTOR	CHAVES	CURRY	DE BACA	HARDING	QUAY	ROOSE-VELT	UNION
PAYROLL EXPENDITURES	2.13	2.09	1.91	1.40	2.05	1.66	1.66
MAINT AND REPAIR OF MIL. FACILITIES	2.07	2.05	1.64	1.68	2.09	1.76	1.76
MOTOR FREIGHT TRANSPORTATION	2.29	2.30	1.70	1.69	2.30	1.98	1.88
COMMUNICATIONS	1.96	1.94	1.61	1.63	1.99	1.72	1.69
ELECTRIC SERVICES	1.79	1.77	1.40	1.36	1.66	1.60	1.56
GAS PRODUCTION AND DISTRIBUTION	2.30	1.97	1.65	1.21	2.05	1.99	1.72
WATER SUPPLY AND SANITARY SERVICES	1.82	1.80	1.50	1.47	1.85	1.62	1.53
WHOLESALE TRADE	2.05	2.02	1.62	1.61	2.03	1.76	1.73
RETAIL TRADE	2.15	2.12	1.72	1.74	2.10	1.85	1.83
PERSONAL SERVICES	2.14	2.09	1.64	1.62	2.10	1.80	1.77
BUSINESS SERVICES	2.22	2.17	1.72	1.73	2.18	1.89	1.85
PROFESSIONAL SERVICES	2.31	2.25	1.78	1.79	2.32	1.94	1.94
OFFBASE HOUSING	N.A.	2.04	N.A.	N.A.	N.A.	1.77	N.A.
STREET FACILITIES	N.A.	2.19	N.A.	N.A.	N.A.	1.87	N.A.
SCHOOL FACILITIES	N.A.	2.01	N.A.	N.A.	N.A.	1.66	N.A.
OTHER PUBLIC BUILDINGS	N.A.	1.97	N.A.	N.A.	N.A.	1.66	N.A.
UTILITIES	N.A.	1.91	N.A.	N.A.	N.A.	1.64	N.A.
RETAIL BUILDINGS	N.A.	1.90	N.A.	N.A.	N.A.	1.64	N.A.
COMMERCIAL BUILDINGS	N.A.	1.98	N.A.	N.A.	N.A.	1.66	N.A.
INDUSTRIAL BUILDINGS	N.A.	1.93	N.A.	N.A.	N.A.	1.97	N.A.

N.A. = NOT APPLICABLE

SOURCE: REGIONAL INDUSTRIAL MULTIPLIER SYSTEM, HDR SCIENCES.

Table 3.1-5. Economic structural change assumptions for MOB area location quotients. (Page 1 of 2)

		LOCATION QUOTIENTS		
	INPUT-OUTPUT SECTOR	CURRY AND ROOSEVELT COUNTIES NEW MEXICO (CANNON AFB)	OTERO COUNTY NEW MEXICO (HOLLOMAN AFB)	ASSUMED VALUE
25	Stone and clay mining and quarrying	.5521	1.9637	1.0
27	New residential 1-unit structures, nonfarm	1.7622	1.5995	1.0
28	New residential 2-4 unit structures, nonfarm	1.7622	1.5995	1.0
29	New residential garden apartments	1.4624	1.5995	0.75
31	New residential additions and alternations, nonfarm	1.7622	1.5995	1.0
32	New hotels and motels	1.4624	1.5995	1.0
33	New dormitories	1.7622	1.5995	1.0
34	New industrial buildings	1.4624	1.5995	0.75
35	New office buildings	1.7622	1.5995	1.0
36	Warehouses	1.7622	1.5995	1.0
37	New garages and service stations	1.7622	1.5995	1.0
38	New stores and restaurants	1.7622	1.5995	1.0
39	New religious buildings	1.7622	1.5995	0.75
40	New educational buildings	1.7622	1.5995	0.75
41	New hospital and institutional buildings	1.7622	1.5995	0.75
42	New other nonfarm buildings	1.7622	1.5995	1.0
43	New telephone and telegraph facilities	1.2538	1.4104	1.0
45	New electric utility facilities	1.2538	1.4104	0.75
46	New gas utility facilities	1.2538	1.4104	0.75
48	New water supply facilities	1.2538	1.4104	0.75
49	New sewer system facilities	1.2538	1.4104	0.75
50	New local transit facilities	1.2538	1.4104	0.75
51	New highways and streets	1.2538	1.4104	1.0
52	New farm housing units and additions and alterations	1.7622	1.5995	1.0
53	New farm service facilities	1.7622	1.5995	1.0
56	New military facilities	1.4624	1.5995	1.0
57	Conservation and development facilities	1.4624	1.5995	1.0
58	New nonbuilding facilities	1.4624	1.5995	0.75
60	Maintenance and repair, residential	1.7622	1.5995	1.0
61	Maintenance and repair of other nonfarm buildings	1.7622	1.5995	1.0
62	Maintenance and repair of farm residential buildings	1.7622	1.5995	1.0
63	Maintenance and repair of farm service facilities	1.7622	1.5995	1.0
64	Maintenance and repair of telephone and telegraph facilities	1.2538	1.4104	1.0
65	Maintenance and repair of railroads	1.2538	1.4104	1.0
66	Maintenance and repair of electric utility facilities	1.2538	1.4104	1.0
67	Maintenance and repair of gas utility facilities	1.2538	1.4104	1.0
68	Maintenance and repair of petroleum pipelines	1.2538	1.4104	1.0
69	Maintenance and repair of water supply facilities	1.2538	1.4104	1.0
70	Maintenance and repair of sewer facilities	1.2538	1.4104	1.0
71	Maintenance and repair of local transit facilities	1.2538	1.4104	1.0
72	Maintenance and repair of military facilities	1.4624	1.5995	1.0
73	Maintenance and repair of conservation and development facilities	1.4624	1.5995	1.0
74	Maintenance and repair of highways and streets	1.2538	1.4104	1.0
76	Maintenance and repair of other nonbuilding facilities	1.4624	1.5995	1.0

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Table 3.1-5. Economic structural change assumptions for MOB area location quotients. (Page 2 of 2)

		LOCATION QUOTIENTS		
	INPUT-OUTPUT SECTOR	CURRY AND ROOSEVELT COUNTIES NEW MEXICO (CANNON AFB)	OTERO COUNTY NEW MEXICO (HOLLOMAN AFB)	ASSUMED VALUE
91	Fluid mild	2.1209	1.1196	1.0
205	Commercial printing	0.6007	1.1381	1.0
267	Ready-mixed concrete	1.9222	4.2121	1.0
445	Local, suburban, and interurban highway passenger transportation	2.5105	1.7477	1.0
446	Motor frieght transportation and warehousing	1.3798	0.7727	1.0
450	Transportation services	0.3040	0.6476	0.5
451	Communications, except radio and TV	1.2186	0.9602	1.0
454	Gas production and distribution (utilities)	3.8543	2.0810	1.0
456	Wholesale trade	1.1660	0.5425	0.75
458	Banking	1.3976	0.9971	1.0
459	Credit agencies	1.2844	1.6240	1.0
460	Security and commodity brokers	0.2872	0.1858	0.2
461	Insurance carriers	0.2014	0.0417	0.1
462	Insurance agents and brokers	1.6120	1.0067	1.0
464	Real Estate	0.8505	1.0238	0.75
466	Personal and repair services except auto and beauty and barber shops	1.6748	1.4717	1.0
468	Miscellaneous business services	0.4117	3.5150	0.75
469	Advertising	0.2330	0.2258	0.2
476	Hospitals	0.7980	0.8429	0.75
477	Other medical and health services	0.7654	0.1437	0.5
478	Education services	0.4119	0.5496	0.5
482	Residential care	2.7060	0.1395	1.0
488	Local government passenger transit	2.5105	1.7477	1.0

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NOTE: In addition to the Location Quotients assumptions shown in this table, Location Quotients for the following industries were changed (assumed values are in parenthesis):

1 Dairy farm products (1.0)
2 Poultry and eggs (1.0)
12 Vegetables (0.5)
85 Poultry dressing plants (1.0)
86 Poultry and egg processing (1.0)
87 Creamery butter (1.0)
88 Cheese, natural and processed (1.0)
89 Condensed and evaporated milk (1.0)
90 Ice cream and frozen desserts (1.0)
106 Bread, cake, and related products (1.0)
116 Bottled and canned soft drinks (1.0)
164 Millworks (1.0)
265 Concrete block and bricks (1.0)
266 Concrete products, etc. (1.0)
481 Child day-care services (1.0)

Source: EDR Sciences, based on data from U.S. Bureau of the Census, County Business Patterns, 1976.

TABLE 3.1-6. MODIFIED R I M S MULTIPLIERS USED IN THE M-X ECONOMIC IMPACT ANALYSIS: NEVADA

SECTOR	CLARK	EUREKA	LINCOLN	NYE	WHITE PINE
PAYROLL EXPENDITURES	2.41	N.A.	N.A.	N.A.	1.81
MAINT. AND REPAIR OF MIL. FACILITIES	2.36	N.A.	N.A.	N.A.	1.87
MOTOR FREIGHT TRANSPORTATION	1.86	N.A.	N.A.	N.A.	2.11
COMMUNICATIONS	3.19	N.A.	N.A.	N.A.	1.80
ELECTRIC SERVICES	2.42	N.A.	N.A.	N.A.	1.66
GAS PRODUCTION AND DISTRIBUTION	3.13	N.A.	N.A.	N.A.	1.97
WATER SUPPLY AND SANITARY SERVICES	3.08	N.A.	N.A.	N.A.	1.70
WHOLESALE TRADE	2.37	N.A.	N.A.	N.A.	1.88
RETAIL TRADE	2.21	N.A.	N.A.	N.A.	1.95
PERSONAL SERVICES	2.31	N.A.	N.A.	N.A.	1.91
BUSINESS SERVICES	2.70	N.A.	N.A.	N.A.	2.01
PROFESSIONAL SERVICES	2.87	N.A.	N.A.	N.A.	2.08
OFFBASE HOUSING	2.87	N.A.	N.A.	N.A.	1.78
STREET FACILITIES	2.49	N.A.	N.A.	N.A.	1.96
SCHOOL FACILITIES	2.63	N.A.	N.A.	N.A.	1.79
OTHER PUBLIC BUILDINGS	2.90	N.A.	N.A.	N.A.	1.79
UTILITIES	2.77	N.A.	N.A.	N.A.	1.72
RETAIL BUILDINGS	2.49	N.A.	N.A.	N.A.	1.73
COMMERCIAL BUILDINGS	2.20	N.A.	N.A.	N.A.	1.78
INDUSTRIAL BUILDINGS	2.74	N.A.	N.A.	N.A.	1.63

N.A. = NOT APPLICABLE

SOURCE: REGIONAL INDUSTRIAL MULTIPLIER SYSTEM, HDR SCIENCES.

TABLE 3.1-7. MODIFIED R.I.M.S. MULTIPLIERS USED IN THE M-X ECONOMIC IMPACT ANALYSIS: UTAH

SECTOR	BEAVER	IRON	JUAB	MILLARD	S. LAKE /UTAH	WASH.
PAYROLL EXPENDITURES	1.87	1.91	N.A.	1.78	1.91	1.91
MAINT. AND REPAIR OF MIL. FACILITIES	1.90	2.09	N.A.	1.84	2.34	2.34
MOTOR FREIGHT TRANSPORTATION	2.12	2.23	N.A.	2.02	1.89	1.89
COMMUNICATIONS	1.81	1.90	N.A.	1.75	2.40	2.40
ELECTRIC SERVICES	1.54	1.74	N.A.	1.54	1.88	1.88
GAS PRODUCTION AND DISTRIBUTION	1.82	1.98	N.A.	1.75	2.44	2.44
WATER SUPPLY AND SANITARY SERVICES	1.66	1.74	N.A.	1.64	2.39	2.39
WHOLESALE TRADE	1.88	1.97	N.A.	1.81	1.88	1.88
RETAIL TRADE	1.94	2.07	N.A.	1.89	1.82	1.82
PERSONAL SERVICES	1.94	2.02	N.A.	1.88	1.91	1.91
BUSINESS SERVICES	2.01	2.13	N.A.	1.94	2.10	2.10
PROFESSIONAL SERVICES	2.11	2.21	N.A.	1.99	2.23	2.23
OFFBASE HOUSING	1.91	1.99	N.A.	1.82	2.21	2.21
STREET FACILITIES	1.98	2.07	N.A.	1.89	1.97	1.97
SCHOOL FACILITIES	1.85	1.86	N.A.	1.71	2.07	2.07
OTHER PUBLIC BUILDINGS	1.84	1.87	N.A.	1.71	2.24	2.24
UTILITIES	1.79	1.80	N.A.	1.67	2.13	2.13
RETAIL BUILDINGS	1.75	1.80	N.A.	1.67	1.97	1.97
COMMERCIAL BUILDINGS	1.82	1.86	N.A.	1.71	1.80	1.80
INDUSTRIAL BUILDINGS	1.66	1.71	N.A.	1.59	2.18	2.18

N.A. = NOT APPLICABLE

SOURCE: REGIONAL INDUSTRIAL MULTIPLIER SYSTEM, HDR SCIENCES.

TABLE 5.1-8. MODIFIED R I M S MULTIPLIERS USED IN THE M-X ECONOMIC IMPACT ANALYSIS
TEXAS

SECTOR	BAILEY	CASTRO	COCHRAN	DALLAM	DEAF SMITH	HALE	HARTLEY	HOCKLEY	LAMB	LUBBOCK	MOORE
PAYROLL EXPENDITURES	N A	N A	N A	1 84	N A	N A	1 61	N A	N A	N A	N A
MAINT AND REPAIR OF MIL FACILITIES	N A	N A	N A	1 89	N A	N A	1 69	N A	N A	N A	N A
MOTOR FREIGHT TRANSPORTATION	N A	N A	N A	2 11	N A	N A	1 86	N A	N A	N A	N A
COMMUNICATIONS	N A	N A	N A	1 79	N A	N A	1 62	N A	N A	N A	N A
ELECTRIC SERVICES	N A	N A	N A	1 65	N A	N A	1 51	N A	N A	N A	N A
GAS PRODUCTION AND DISTRIBUTION	N A	N A	N A	1 80	N A	N A	1 63	N A	N A	N A	N A
WATER SUPPLY AND SANITARY SERVICES	N A	N A	N A	1 66	N A	N A	1 54	N A	N A	N A	N A
WHOLESALE TRADE	N A	N A	N A	1 88	N A	N A	1 66	N A	N A	N A	N A
RETAIL TRADE	N A	N A	N A	1 95	N A	N A	1 73	N A	N A	N A	N A
PERSONAL SERVICES	N A	N A	N A	1 92	N A	N A	1 70	N A	N A	N A	N A
BUSINESS SERVICES	N A	N A	N A	2 02	N A	N A	1 76	N A	N A	N A	N A
PROFESSIONAL SERVICES	N A	N A	N A	2 10	N A	N A	1 80	N A	N A	N A	N A
OFFBASE HOUSING	N A	N A	N A	1 90	N A	N A	1 65	N A	N A	N A	N A
STREET FACILITIES	N A	N A	N A	1 87	N A	N A	1 73	N A	N A	N A	N A
SCHOOL FACILITIES	N A	N A	N A	1 84	N A	N A	1 52	N A	N A	N A	N A
OTHER PUBLIC BUILDINGS	N A	N A	N A	1 84	N A	N A	1 54	N A	N A	N A	N A
UTILITIES	N A	N A	N A	1 74	N A	N A	1 54	N A	N A	N A	N A
RETAIL BUILDINGS	N A	N A	N A	1 75	N A	N A	1 54	N A	N A	N A	N A
COMMERCIAL BUILDINGS	N A	N A	N A	1 82	N A	N A	1 55	N A	N A	N A	N A
INDUSTRIAL BUILDINGS	N A	N A	N A	1 65	N A	N A	1 48	N A	N A	N A	N A

N A = NOT APPLICABLE

SECTOR	OLDHAM	PARMER	POTTER/ RANDALL	SHERMAN	SWISHER
PAYROLL EXPENDITURES	N A	N A	N A	N A	N A
MAINT AND REPAIR OF MIL FACILITIES	N A	N A	N A	N A	N A
MOTOR FREIGHT TRANSPORTATION	N A	N A	N A	N A	N A
COMMUNICATIONS	N A	N A	N A	N A	N A
ELECTRIC SERVICES	N A	N A	N A	N A	N A
GAS PRODUCTION AND DISTRIBUTION	N A	N A	N A	N A	N A
WATER SUPPLY AND SANITARY SERVICES	N A	N A	N A	N A	N A
WHOLESALE TRADE	N A	N A	N A	N A	N A
RETAIL TRADE	N A	N A	N A	N A	N A
PERSONAL SERVICES	N A	N A	N A	N A	N A
BUSINESS SERVICES	N A	N A	N A	N A	N A
PROFESSIONAL SERVICES	N A	N A	N A	N A	N A
OFFBASE HOUSING	N A	N A	N A	N A	N A
STREET FACILITIES	N A	N A	N A	N A	N A
SCHOOL FACILITIES	N A	N A	N A	N A	N A
OTHER PUBLIC BUILDINGS	N A	N A	N A	N A	N A
UTILITIES	N A	N A	N A	N A	N A
RETAIL BUILDINGS	N A	N A	N A	N A	N A
COMMERCIAL BUILDINGS	N A	N A	N A	N A	N A
INDUSTRIAL BUILDINGS	N A	N A	N A	N A	N A

N A = NOT APPLICABLE

SOURCE: REGIONAL INDUSTRIAL MULTIPLIER SYSTEM, HDR SCIENCES.

TABLE 3.1-9. MODIFIED R.I.M.S. MULTIPLIERS USED IN THE M-X ECONOMIC IMPACT ANALYSIS: NEW MEXICO

SECTOR	CHAVES	CURRY	DE BACA	HARDING	GUAY	ROOSE-VELT	UNION
PAYROLL EXPENDITURES	N.A.	2.09	N.A.	N.A.	N.A.	1.77	N.A.
MAINT. AND REPAIR OF MIL. FACILITIES	N.A.	2.07	N.A.	N.A.	N.A.	1.82	N.A.
MOTOR FREIGHT TRANSPORTATION	N.A.	2.32	N.A.	N.A.	N.A.	2.00	N.A.
COMMUNICATIONS	N.A.	1.95	N.A.	N.A.	N.A.	1.73	N.A.
ELECTRIC SERVICES	N.A.	1.78	N.A.	N.A.	N.A.	1.60	N.A.
GAS PRODUCTION AND DISTRIBUTION	N.A.	1.97	N.A.	N.A.	N.A.	1.99	N.A.
WATER SUPPLY AND SANITARY SERVICES	N.A.	1.81	N.A.	N.A.	N.A.	1.63	N.A.
WHOLESALE TRADE	N.A.	2.04	N.A.	N.A.	N.A.	1.78	N.A.
RETAIL TRADE	N.A.	2.14	N.A.	N.A.	N.A.	1.86	N.A.
PERSONAL SERVICES	N.A.	2.12	N.A.	N.A.	N.A.	1.82	N.A.
BUSINESS SERVICES	N.A.	2.21	N.A.	N.A.	N.A.	1.90	N.A.
PROFESSIONAL SERVICES	N.A.	2.27	N.A.	N.A.	N.A.	1.95	N.A.
OFFBASE HOUSING	N.A.	2.04	N.A.	N.A.	N.A.	1.77	N.A.
STREET FACILITIES	N.A.	2.19	N.A.	N.A.	N.A.	1.87	N.A.
SCHOOL FACILITIES	N.A.	2.01	N.A.	N.A.	N.A.	1.66	N.A.
OTHER PUBLIC BUILDINGS	N.A.	1.97	N.A.	N.A.	N.A.	1.66	N.A.
UTILITIES	N.A.	1.91	N.A.	N.A.	N.A.	1.64	N.A.
RETAIL BUILDINGS	N.A.	1.90	N.A.	N.A.	N.A.	1.64	N.A.
COMMERCIAL BUILDINGS	N.A.	1.98	N.A.	N.A.	N.A.	1.66	N.A.
INDUSTRIAL BUILDINGS	N.A.	1.93	N.A.	N.A.	N.A.	1.57	N.A.

N.A. = NOT APPLICABLE

SOURCE: REGIONAL INDUSTRIAL MULTIPLIER SYSTEM, HDR SCIENCES.

category of final demand change - personal consumption expenditures, procurement outlays, and related investment, by sector - and added together to estimate the total change in regional gross output considering all the project-related changes in final demand. These demand changes are presented in Section 2 of this report. In the case of operations procurement, the totals presented in Tables 2.5-7 through 2.5-16 are disaggregated by sector using the distribution in Table 2.5-4.

This total gross output change is not, however, assumed to take place all within the same year the demands originate. Some lag between initial changes in demand and the full multiplier effects of those demand changes is likely. The length and distribution of this lag is uncertain, since comprehensive industry-specific data are not available for the states under consideration as deployment areas. As an approximation, this analysis assumes that 70 percent of these multiplier effects occur the first year, 20 percent the second year, and 10 percent the third year. Data available for the Oklahoma economy indicate an interindustry average considerably longer than this three-year lag structure (see Liew, 1977). However, the Oklahoma data probably are more representative of incremental changes in an economy than of large, consumption-oriented demands such as those likely to accompany the M-X project.

The change in total output is translated into a change in region-wide earnings by using industry-specific and region-specific earnings-gross output ratios. These coefficients are derived from the data presented in Table 3.2-1. Total indirect and induced earnings are then used to estimate indirect and induced employment on the assumption that earnings per worker are $13,000 per year (fiscal year 1980 dollars).

Table 3.2-1. Earnings - Gross Output Ratios Used in the M-X Economic Impact Analysis

Industry	Earnings - Gross Output Ratio
PERSONAL CONSUMPTION EXPENDITURES	.3214
MAINTENANCE AND REPAIR OF MIL. FACILITIES	.4420
MOTOR FREIGHT TRANSPORTATION	.4630
COMMUNICATIONS	.4180
ELECTRIC SERVICES	.1810
GAS PRODUCTION AND DISTRIBUTION	.1220
WATER SUPPLY AND SANITARY SERVICES	.2270
WHOLESALE TRADE	.3920
RETAIL TRADE	.4760
PERSONAL SERVICES	.3760
BUSINESS SERVICES	.4570
PROFESSIONAL SERVICES	.5290
OFFBASE HOUSING CONSTRUCTION	.3290
STREET FACILITIES CONSTRUCTION	.3530
SCHOOL FACILITIES CONSTRUCTION	.2880
OTHER PUBLIC BUILDINGS CONSTRUCTION	.3130
UTILITIES CONSTRUCTION	.3020
RETAIL BUILDINGS CONSTRUCTION	.3060
COMMERCIAL BUILDINGS CONSTRUCTION	.3060
INDUSTRIAL BUILDINGS CONSTRUCTION	.3030

Note: The earnings:gross output ratio for industry i in region j ($e(i,j)$) is estimated as:

$$e(i,j) = (1/m(i,j))e(i) + (1 - 1/m(i,j))e^*$$

where $m(i,j)$ is the estimated multiplier for industry i in region j, $e(i)$ is the U.S. average earnings:gross output ratio for industry i shown in this table, and e^* is the U.S. economy-wide average earnings:gross output ratio.

Source: 1972 U.S. Input-Output Tables, Bureau of Economic Analysis, U.S. Department of Commerce.

4.0 EMPLOYMENT, LABOR FORCE, AND POPULATION IMPACTS BY PLACE OF RESIDENCE

Project demands and interindustry estimates of M-X-related employment yield estimates of the primary and secondary employment impacts of the M-X system by place of employment. The next stage of the analysis translates these impacts by place of employment into impacts by place of residence. The result is specifically to introduce cross-county migration into the analysis, projecting a single-county demand for labor into a multi-county labor market. Comparing these employment impacts by county of residence to the available resident labor force in that county then permits estimation of labor force and population migration into the county.

4.1 EMPLOYMENT-RESIDENCE ADJUSTMENT ASSUMPTIONS

The county interindustry models and project-related final demand changes produce estimates of labor demand by county of employment. These projections are translated into labor demand projections by county of residence by means of employment-residence allocation matrices by employment type. These matrices incorporate assumptions about the place of residence of persons employed as a result of the project. The matrices also transform a "point" labor demand into a regional labor demand which spills across county boundaries. These matrices are estimated judgmentally, using general gravity-type considerations of distance to nearby population centers and the level of services likely to be available at each place. These matrics are specific to each employment type but constant through time.

The matrices for the Nevada/Utah study region for all seven employment types - DDA construction, DDA assembly and checkout, base construction, base assembly and checkout, military personnel, operations civilians, and indirectly employed persons - are presented as Tables 4.1-1 through 4.1-7. The Nevada/Utah tables are followed by the matrices for Texas/New Mexico for the same seven employment types, Tables 4.1-8 through 4.1-14. The counties identified down the left side of the tables are counties of M-X-related employment, while counties of residence are listed across the top of the table.

The maps presented here as Figures 2.2-1 and 2.2-2 show the locations of the communities in the study region, county boundaries, and major transportation routes, and provide a basis for interpreting the assumptions specified in Tables 4.1-1 through 4.1-14. For example, in Table 4.1-6, civilian operations workers employed on a base at Milford in Beaver County (row 7) are assumed to live in Iron, Beaver, and Millard counties, in the proportions shown: 90 percent in Beaver County, 5 percent in Iron County, and 5 percent in Millard County. All assembly and checkout workers are assumed to be present without families and living in construction camps. The matrices for these employment groups therefore are diagonal, with 100 percent of the workers employed in a county also living in that county. Indirect workers also are assumed to live in the counties in which they are employed. DDA construction workers are assumed to be the most mobile employment group.

4.2 AVAILABLE RESIDENT LABOR FORCE

The available resident labor force is defined as the baseline projected unemployed labor force less an estimate of that portion of the labor force which probably would remain unemployed even under extremely tight labor market

TABLE 4.1-1. COUNTY EMPLOYMENT - RESIDENCE ALLOCATION MATRIX NEVADA/UTAH
EMPLOYMENT TYPE: DDA CONSTRUCTION
(PERCENT)

COUNTY#\COUNTY#	1	2	3	4	5	6	7	8	9	10	11
1	95	0	0	5	0	0	0	0	0	0	0
2	0	70	0	0	30	0	0	0	0	0	0
3	5	5	70	0	20	0	0	0	0	0	0
4	5	0	0	95	0	0	0	0	0	0	0
5	0	0	0	0	100	0	0	0	0	0	0
6	0	0	0	0	0	100	0	0	0	0	0
7	0	5	0	0	5	5	75	5	0	5	0
8	0	0	0	0	0	0	5	80	5	10	0
9	0	0	0	0	0	0	0	10	65	25	0
10	0	0	0	0	0	0	0	0	0	100	0
11	0	0	0	0	0	0	0	0	0	0	100

COUNTY KEY

1-WHITE PINE
2-LINCOLN
3-NYE
4-EUREKA
5-CLARK
6-IRON
7-BEAVER
8-MILLARD
9-JUAB
10-SALT LAKE/UTAH
11-WASHINGTON

SOURCE: HDR SCIENCES

TABLE 4.1-2. COUNTY EMPLOYMENT - RESIDENCE ALLOCATION MATRIX NEVADA/UTAH
EMPLOYMENT TYPE: DDA ASSEMBLY & CHECKOUT
(PERCENT)

COUNTY@\COUNTY@	1	2	3	4	5	6	7	8	9	10	11
1	100	0	0	0	0	0	0	0	0	0	0
2	0	100	0	0	0	0	0	0	0	0	0
3	0	0	100	0	0	0	0	0	0	0	0
4	0	0	0	100	0	0	0	0	0	0	0
5	0	0	0	0	100	0	0	0	0	0	0
6	0	0	0	0	0	100	0	0	0	0	0
7	0	0	0	0	0	0	100	0	0	0	0
8	0	0	0	0	0	0	0	100	0	0	0
9	0	0	0	0	0	0	0	0	100	0	0
10	0	0	0	0	0	0	0	0	0	100	0
11	0	0	0	0	0	0	0	0	0	0	100

COUNTY KEY

1-WHITE PINE
2-LINCOLN
3-NYE
4-EUREKA
5-CLARK
6-IRON
7-BEAVER
8-MILLARD
9-JUAB
10-SALT LAKE/UTAH
11-WASHINGTON

SOURCE: HDR SCIENCES

TABLE 4.1-3. COUNTY EMPLOYMENT - RESIDENCE ALLOCATION MATRIX NEVADA/UTAH
EMPLOYMENT TYPE: BASE CONSTRUCTION
(PERCENT)

COUNTY@\COUNTY@	1	2	3	4	5	6	7	8	9	10	11
1	100	0	0	0	0	0	0	0	0	0	0
2	0	100	0	0	0	0	0	0	0	0	0
3	0	0	100	0	0	0	0	0	0	0	0
4	0	0	0	100	0	0	0	0	0	0	0
5	0	5	0	0	95	0	0	0	0	0	0
6	0	5	0	0	15	60	5	0	0	5	10
7	0	0	0	0	10	10	70	0	0	10	0
8	0	0	0	0	5	0	0	70	5	20	0
9	0	0	0	0	0	0	0	0	100	0	0
10	0	0	0	0	0	0	0	0	0	100	0
11	0	0	0	0	0	0	0	0	0	0	100

COUNTY KEY

1-WHITE PINE
2-LINCOLN
3-NYE
4-EUREKA
5-CLARK
6-IRON
7-BEAVER
8-MILLARD
9-JUAB
10-SALT LAKE/UTAH
11-WASHINGTON

SOURCE: HDR SCIENCES

TABLE 4.1-4. COUNTY EMPLOYMENT - RESIDENCE ALLOCATION MATRIX NEVADA/UTAH
EMPLOYMENT TYPE: BASE ASSEMBLY & CHECKOUT
(PERCENT)

COUNTY#\COUNTY#	1	2	3	4	5	6	7	8	9	10	11
1	100	0	0	0	0	0	0	0	0	0	0
2	0	100	0	0	0	0	0	0	0	0	0
3	0	0	100	0	0	0	0	0	0	0	0
4	0	0	0	100	0	0	0	0	0	0	0
5	0	0	0	0	100	0	0	0	0	0	0
6	0	0	0	0	0	100	0	0	0	0	0
7	0	0	0	0	0	0	100	0	0	0	0
8	0	0	0	0	0	0	0	100	0	0	0
9	0	0	0	0	0	0	0	0	100	0	0
10	0	0	0	0	0	0	0	0	0	100	0
11	0	0	0	0	0	0	0	0	0	0	100

COUNTY KEY

1-WHITE PINE
2-LINCOLN
3-NYE
4-EUREKA
5-CLARK
6-IRON
7-BEAVER
8-MILLARD
9-JUAB
10-SALT LAKE/UTAH
11-WASHINGTON

SOURCE: HDR SCIENCES

TABLE 4.1-5. COUNTY EMPLOYMENT - RESIDENCE ALLOCATION MATRIX NEVADA/UTAH
EMPLOYMENT TYPE: OPERATIONS, MILITARY
(PERCENT)

COUNTY#\COUNTY#	1	2	3	4	5	6	7	8	9	10	11
1	100	0	0	0	0	0	0	0	0	0	0
2	0	100	0	0	0	0	0	0	0	0	0
3	0	0	100	0	0	0	0	0	0	0	0
4	0	0	0	100	0	0	0	0	0	0	0
5	0	0	0	0	100	0	0	0	0	0	0
6	0	0	0	0	0	90	5	0	0	0	5
7	0	0	0	0	0	10	90	0	0	0	0
8	0	0	0	0	0	0	0	95	5	0	0
9	0	0	0	0	0	0	0	0	100	0	0
10	0	0	0	0	0	0	0	0	0	100	0
11	0	0	0	0	0	0	0	0	0	0	100

COUNTY KEY

1-WHITE PINE
2-LINCOLN
3-NYE
4-EUREKA
5-CLARK
6-IRON
7-BEAVER
8-MILLARD
9-JUAB
10-SALT LAKE/UTAH
11-WASHINGTON

SOURCE: HDR SCIENCES

TABLE 4.1-6. COUNTY EMPLOYMENT - RESIDENCE ALLOCATION MATRIX NEVADA/UTAH
EMPLOYMENT TYPE: OPERATIONS, CIVILIAN
(PERCENT)

COUNTY#\COUNTY#	1	2	3	4	5	6	7	8	9	10	11
1	100	0	0	0	0	0	0	0	0	0	0
2	0	100	0	0	0	0	0	0	0	0	0
3	0	0	100	0	0	0	0	0	0	0	0
4	0	0	0	100	0	0	0	0	0	0	0
5	0	5	0	0	95	0	0	0	0	0	0
6	0	5	0	0	0	85	5	0	0	0	5
7	0	0	0	0	0	5	90	5	0	0	0
8	0	0	0	0	0	0	5	90	5	0	0
9	0	0	0	0	0	0	0	0	100	0	0
10	0	0	0	0	0	0	0	0	0	100	0
11	0	0	0	0	0	0	0	0	0	0	100

COUNTY KEY

1-WHITE PINE
2-LINCOLN
3-NYE
4-EUREKA
5-CLARK
6-IRON
7-BEAVER
8-MILLARD
9-JUAB
10-SALT LAKE/UTAH
11-WASHINGTON

SOURCE: HDR SCIENCES

TABLE 4.1-7. COUNTY EMPLOYMENT - RESIDENCE ALLOCATION MATRIX NEVADA/UTAH
EMPLOYMENT TYPE: INDIRECT EMPLOYMENT
(PERCENT)

COUNTY#\COUNTY#	1	2	3	4	5	6	7	8	9	10	11
1	100	0	0	0	0	0	0	0	0	0	0
2	0	100	0	0	0	0	0	0	0	0	0
3	0	0	100	0	0	0	0	0	0	0	0
4	0	0	0	100	0	0	0	0	0	0	0
5	0	0	0	0	100	0	0	0	0	0	0
6	0	0	0	0	0	100	0	0	0	0	0
7	0	0	0	0	0	0	100	0	0	0	0
8	0	0	0	0	0	0	0	100	0	0	0
9	0	0	0	0	0	0	0	0	100	0	0
10	0	0	0	0	0	0	0	0	0	100	0
11	0	0	0	0	0	0	0	0	0	0	100

COUNTY KEY

1-WHITE PINE
2-LINCOLN
3-NYE
4-EUREKA
5-CLARK
6-IRON
7-BEAVER
8-MILLARD
9-JUAB
10-SALT LAKE/UTAH
11-WASHINGTON

SOURCE: HDR SCIENCES.

TABLE 4.1-8. COUNTY EMPLOYMENT - RESIDENCE ALLOCATION MATRIX TEXAS/NEW MEXICO
EMPLOYMENT TYPE: DDA CONSTRUCTION
(PERCENT)

COUNTY#\COUNTY#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	50	20	0	0	0	0	10	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	30	50	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	50	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	50	0	0	0	25	10	0	0	0	15	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	50	0	0	0	25	0	0	0	15	10	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
11	10	10	0	0	0	0	0	10	0	0	60	10	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	10	10	0	0	50	30	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	20	0	0	15	15	50	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	25	0	0	0	15	10	50	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
23	0	0	0	0	0	0	0	15	15	0	0	0	10	0	0	0	0	0	0	10	0	0	50

COUNTY KEY

1-DALLAM	6-COCHRAN	11-HARDING	16-DEBACA	21-HOCKLEY
2-HARTLEY	7-MOORE	12-QUAY	17-SHERMAN	22-OLDHAM
3-DEAF SMITH	8-POTTER/RANDALL	13-CURRY	18-SWISHER	23-CASTRO
4-PARMER	9-LUBBOCK	14-ROOSEVELT	19-LAMB	
5-BAILEY	10-UNION	15-CHAVES	20-HALE	

SOURCE: HDR SCIENCES

TABLE 4.1-2. COUNTY EMPLOYMENT - RESIDENCE ALLOCATION MATRIX TEXAS/NEW MEXICO
EMPLOYMENT TYPE: DDA ASSEMBLY & CHECKOUT
(PERCENT)

COUNTY#\COUNTY#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100

COUNTY KEY

1 DALLAM	6-COCHRAN	11-HARDING	16-DEBACA	21 HOCKLEY
2-HARTLEY	7-MOORE	12-QUAY	17-SHERMAN	22 OLDHAM
3-DEAF SMITH	8-POTTER/RANDALL	13-CURRY	18-SWISHER	23-CASTRO
4-PARMER	9-LUBBOCK	14-ROOSEVELT	19-LAMB	
5-BAILEY	10-UNION	15-CHAVES	20 HALE	

SOURCE: HDR SCIENCES

TABLE 4.1-10. COUNTY EMPLOYMENT - RESIDENCE ALLOCATION MATRIX TEXAS/NEW MEXICO
EMPLOYMENT TYPE: BASE CONSTRUCTION
(PERCENT)

COUNTY#\COUNTY#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	10	50	0	0	0	0	5	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	20	20	0	0	0	50	10	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100

COUNTY KEY

1-DALLAM	6-COCHRAN	11-HARDING	16-DEBACA	21-HOCKLEY
2-HARTLEY	7-MOORE	12-GUAY	17-SHERMAN	22-OLDHAM
3-DEAF SMITH	8-POTTER/RANDALL	13-CURRY	18-SWISHER	23-CASTRO
4-PARMER	9-LUBBOCK	14-ROOSEVELT	19-LAMB	
5-BAILEY	10-UNION	15-CHAVES	20-HALE	

SOURCE: HDR SCIENCES

TABLE 4.7-11. COUNTY EMPLOYMENT - RESIDENCE ALLOCATION MATRIX TEXAS/NEW MEXICO
EMPLOYMENT TYPE: BASE ASSEMBLY & CHECKOUT
(PERCENT)

COUNTY#\COUNTY#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100

COUNTY KEY

1-DALLAM	6-COCHRAN	11-HARDING	16-DEBACA	21-HOCKLEY
2-HARTLEY	7-MOORE	12-QUAY	17-SHERMAN	22-OLDHAM
3-DEAF SMITH	8-POTTER/RANDALL	13-CURRY	18-SWISHER	23-CASTRO
4-PARMER	9-LUBBOCK	14-ROOSEVELT	19-LAMB	
5-BAILEY	10-UNION	15-CHAVES	20-HALE	

SOURCE: HDR SCIENCES

TABLE 4.1.12. COUNTY EMPLOYMENT - RESIDENCE ALLOCATION MATRIX TEXAS/NEW MEXICO
EMPLOYMENT TYPE OPERATIONS, MILITARY
(PERCENT)

COUNTY#\COUNTY#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	5	85	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	90	10	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100

COUNTY KEY

1-DALLAM	6-COCHRAN	11-HARDING	16-DEBACA	21 HOCKLEY
2-HARTLEY	7-MOORE	12-QUAY	17-SHERMAN	22 OLDHAM
3-DEAF SMITH	8-POTTER/RANDALL	13-CURRY	18-SWISHER	23-CASTRO
4-PARMER	9-LUBBOCK	14-ROOSEVELT	19-LAMB	
5-BAILEY	10-UNION	15-CHAVES	20-HALE	

SOURCE: HDR SCIENCES

TABLE 4.1-13. COUNTY EMPLOYMENT - RESIDENCE ALLOCATION MATRIX TEXAS/NEW MEXICO
EMPLOYMENT TYPE: OPERATIONS, CIVILIAN
(PERCENT)

COUNTY#\COUNTY#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	35	35	0	0	0	0	20	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	90	10	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100

COUNTY KEY

1-DALLAM	6-COCHRAN	11-HARDING	16-DEBACA	21 HOCKLEY
2-HARTLEY	7-MOORE	12-QUAY	17-SHERMAN	22 OLDHAM
3-DEAF SMITH	8-POTTER/RANDALL	13-CURRY	18-SWISHER	23 CASTRO
4-PARMER	9-LUBBOCK	14-ROOSEVELT	19-LAMB	
5-BAILEY	10-UNION	15-CHAVES	20-HALE	

SOURCE: HDR SCIENCES

TABLE 4.1-14. COUNTY EMPLOYMENT - RESIDENCE ALLOCATION MATRIX TEXAS/NEW MEXICO
EMPLOYMENT TYPE INDIRECT EMPLOYMENT
(PERCENT)

COUNTY#\COUNTY#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100

COUNTY KEY

1-DALLAM
2-HARTLEY
3-DEAF SMITH
4-PARMER
5-BAILEY
6-COCHRAN
7-MOORE
8-POTTER/RANDALL
9-LUBBOCK
10-UNION
11-HARDING
12-QUAY
13-CURRY
14-ROOSEVELT
15-CHAVES
16-DEBACA
17-SHERMAN
18-SWISHER
19-LAMB
20-HALE
21 HOCKLEY
22 OLDHAM
23 CASTRO

SOURCE: HDR SCIENCES

conditions. The size of the available resident labor force depends on baseline projections of area population, labor force, and unemployment.

Population. For Nevada and Utah, baseline projections of population are those provided by the University of Utah's Bureau of Economic and Business Research. Two baselines are used for Nevada/Utah - (1) a trend-growth baseline, and (2) a baseline with adjustments for several large projects with significant probability of occurrence in the study region. Specifically, Baseline 1 includes the following:

- o Continuation of 1967-1978 growth trends;
- o Implementation of the Anaconda Nevada Molybdenum Project (Nye County);
- o Metal mining in Eureka, White Pine and Lander counties;
- o Expansion of oil and gas activity; and
- o Minerals exploration in the Utah portion of the ROI.

Baseline 2 includes, in addition to these activities, the following projects:

- o White Pine County - White Pine Power Project and reopening the Kennecott Copper Company mine;
- o Millard County - Intermountain Power Project, Continental Lime cement plant, Brush Beryllium expansion, Precision-Built Modular Homes, and the Martin-Marietta cement plant;
- o Juab County - General Battery, and SUFCO coal loading facility; and
- o Beaver County - geothermal power activity, molybdenum mining, and alunite mining and processing.

There is a degree of uncertainty regarding each of these projects, though some may be more likely than others. These assumptions were developed by the University of Utah's Bureau of Economic and Business Research, and reviewed by the State Planning Coordinators Offices of Nevada and Utah.

Washington County, Utah, baseline projections are those of the Utah State Planning Coordinator's Office (January 1980).

Texas county population projections are taken from the Texas State Water Board, while the New Mexico projections are from the Bureau of Business and Economic Research, University of New Mexico. Tables 4.2-1 through 4.2-3 present these projections.

A "high-growth" baseline also was developed for the Texas/New Mexico region, but differed only slightly from the projections shown in Table 4.2-3. Appendix E presents the results of this analysis.

Labor Force. Labor force projections for all counties analyzed in this study are based on projected crude labor force participation rates and the baseline population projections. The labor force participation rate for each county is projected at its average value over the period 1975-78. No adjustments are made to participation rates for increased employment opportunities related to the M-X system due to the inadequacy of data to estimate this effect. Tables 4.2-4 and 4.2-5 display these projections. To the extent that local labor force participation rates increase as a result of M-X, the in-migration estimates produced in this analysis will be high. Since it is not feasible to eliminate this source of possible bias, the assumptions implying larger in-migration impacts are used in this study.

TABLE 4.2-1. BASELINE POPULATION PROJECTIONS
TREND GROWTH BASELINE
NEVADA/UTAH

COUNTY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BEAVER	4658	4778	4911	5051	5115	5161	5207	5254	5297	5357	5417	5471	5516
CLARK	485433	503411	523124	543857	559947	575277	591443	607435	623794	639690	655936	671515	686699
EUREKA	1101	1121	1144	1169	1190	1211	1234	1255	1278	1301	1324	1347	1368
IRON	18410	18993	19649	20348	20861	21346	21851	22369	22895	23314	23747	24164	24556
JUAB	5995	6265	6563	6888	7044	7190	7345	7496	7650	7764	7877	7983	8077
LINCOLN	3765	3850	3943	4043	4121	4194	4272	4347	4424	4500	4576	4647	4715
MILLARD	9608	10013	10458	10940	11192	11432	11682	11931	12179	12285	12378	12463	12528
NYE	10000	10246	10513	10799	11033	11258	11497	11730	11971	12208	12445	12677	12901
SALT LAKE/UTAH	876056	907980	942941	980701	1001845	1020860	1040976	1060249	1079131	1096781	1114088	1130135	1144685
WASHINGTON	24046	25055	26105	27200	27948	28716	29505	30317	31150	31793	32449	33119	33802
WHITE PINE	8346	8426	8522	8630	8809	8987	9152	9346	9545	9725	9905	10077	10238
DEPLOYMENT REGION	1447418	1500138	1557873	1619626	1659103	1695632	1734164	1771729	1809314	1844718	1880142	1913598	1945085

SOURCE: UNIVERSITY OF UTAH, BUREAU OF ECONOMIC AND BUSINESS RESEARCH.

TABLE 4.2-2. BASELINE POPULATION PROJECTIONS
HIGH GROWTH BASELINE
NEVADA/UTAH

COUNTY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BEAVER	6548	8663	9835	10993	11983	10023	9715	9814	9965	10130	10291	10455	10566
CLARK	485637	503767	523668	544830	561081	576424	592496	608301	624539	640475	656753	672367	687585
EUREKA	1101	1122	1144	1169	1191	1212	1234	1255	1278	1301	1325	1347	1368
IRON	18448	19066	19753	20500	21033	21497	21991	22493	23006	23427	23864	24281	24677
JUAB	6536	7699	8539	9274	9276	9430	9330	8954	8364	8494	8623	8746	8849
LINCOLN	3765	3852	3945	4049	4127	4200	4278	4352	4429	4503	4580	4652	4720
MILLARD	11899	12671	15842	18746	18489	18875	18347	16140	14920	15067	15234	15379	15504
NYE	10000	10247	10515	10804	11041	11265	11503	11735	11974	12214	12451	12683	12906
SALT LAKE/UTAH	877477	910480	946894	987123	1008958	1028068	1047560	1065451	1083344	1101213	1118719	1134918	1149699
WASHINGTON	24046	25055	26105	27200	27948	28716	29505	30317	31150	31793	32449	33119	33802
WHITE PINE	8348	8431	8746	12975	14738	16768	16191	14777	13902	14196	14514	14771	15050
DEPLOYMENT REGION	1453805	1511053	1574982	1647663	1689865	1726478	1762150	1793589	1826871	1862813	1898803	1932718	1964726

SOURCE: UNIVERSITY OF UTAH, BUREAU OF ECONOMIC AND BUSINESS RESEARCH.

TABLE 4.2-3. BASELINE POPULATION PROJECTIONS
TREND GROWTH BASELINE
TEXAS/NEW MEXICO

COUNTY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BAILEY	8330	8350	8370	8400	8410	8430	8450	8470	8490	8500	8500	8500	8500
CASTRO	10570	10610	10650	10700	10770	10850	10930	11010	11090	11190	11290	11390	11490
CHAVES	53470	54330	55210	56100	56890	57700	58520	59350	60190	60940	61690	62450	63220
COCHRAN	5200	5200	5200	5200	5200	5200	5200	5200	5200	5230	5270	5310	5350
CURRY	43870	44010	44150	44290	44310	44330	44350	44370	44400	44310	44230	44150	44070
DALLAM	6850	6930	7010	7100	7170	7250	7330	7410	7500	7610	7730	7850	7970
DEAF SMITH	19970	20110	20250	20400	20610	20830	21050	21270	21500	21750	22010	22270	22530
DE BACA	2600	2600	2600	2600	2570	2550	2530	2510	2500	2500	2500	2500	2500
HALE	38080	38480	38890	39300	39710	40120	40540	40970	41390	41920	42450	42990	43540
HARDING	1050	1030	1010	1000	970	950	930	910	890	850	810	770	730
HARTLEY	3650	3730	3810	3890	3970	4050	4130	4210	4290	4370	4450	4530	4610
HOCKLEY	21730	21850	21970	22090	22190	22290	22390	22490	22600	22730	22870	23010	23150
LAMB	17400	17400	17400	17400	17370	17350	17330	17310	17290	17300	17300	17300	17300
LUBBOCK	220240	223380	226570	229790	232410	235060	237740	240450	243190	245950	248740	251560	254410
MOORE	14610	14670	14730	14800	14870	14950	15030	15110	15190	15290	15390	15490	15590
OLDHAM	2730	2750	2770	2790	2830	2870	2910	2950	3000	3050	3110	3170	3230
PARMER	10300	10300	10300	10300	10310	10330	10350	10370	10400	10470	10550	10630	10710
POTTER/RANDALL	166540	168580	170660	172780	174780	176800	178860	180960	183100	185280	187500	189760	192060
QUAY	11230	11250	11270	11290	11270	11250	11230	11210	11200	11150	11110	11070	11030
ROOSEVELT	16610	16670	16730	16800	16870	16950	17030	17110	17200	17270	17350	17430	17510
SHERMAN	3830	3850	3870	3890	3910	3930	3950	3970	4000	4030	4070	4110	4150
SWISHER	10570	10610	10650	10700	10770	10850	10930	11010	11090	11210	11330	11450	11570
UNION	4850	4830	4810	4800	4810	4830	4850	4870	4900	4900	4900	4900	4900
DEPLOYMENT REGION	694280	701520	708880	716410	722970	729720	736560	743490	750600	757800	765150	772590	780120

Source: Texas State Water Board and University of New Mexico, Bureau of Business and Economic Research.

TABLE 4.2-4. BASELINE LABOR FORCE PARTICIPATION RATE PROJECTIONS
(PERCENT)
NEVADA/UTAH

COUNTY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BEAVER	46.1	46.1	46.1	46.1	46.1	46.1	46.1	46.1	46.1	46.1	46.1	46.1	46.1
CLARK	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2
EUREKA	54.2	54.2	54.2	54.2	54.2	54.2	54.2	54.2	54.2	54.2	54.2	54.2	54.2
IRON	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
JUAB	38.4	38.4	38.4	38.4	38.4	38.4	38.4	38.4	38.4	38.4	38.4	38.4	38.4
LINCOLN	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1
MILLARD	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7
NYE	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2
SALT LAKE/UTAH	46.2	46.2	46.2	46.2	46.2	46.2	46.2	46.2	46.2	46.2	46.2	46.2	46.2
WASHINGTON	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5
WHITE PINE	39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5
DEPLOYMENT REGION	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5

SOURCE: DERIVED FROM HISTORICAL DATA PROVIDED BY STATE DEPARTMENT OF EMPLOYMENT SECURITY.

TABLE 4.2-5. BASELINE LABOR FORCE PARTICIPATION RATE PROJECTIONS
(PERCENT)
TEXAS/NEW MEXICO

COUNTY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BAILEY	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5
CASTRO	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4
CHAVES	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8
COCHRAN	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
CURRY	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
DALLAM	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8
DEAF SMITH	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7
DE BACA	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1
HALE	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8
HARDING	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6
HARTLEY	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5
HOCKLEY	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4
LAMB	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8
LUBBOCK	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4
MOORE	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8
OLDHAM	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1
PARMER	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4
POTTER/RANDALL	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5
QUAY	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1
ROOSEVELT	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5
SHERMAN	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
SWISHER	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5
UNION	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
DEPLOYMENT REGION	45.8	45.8	45.8	45.8	45.8	45.8	45.8	45.8	45.8	45.8	45.9	45.9	45.9

SOURCE: DERIVED FROM HISTORICAL DATA PROVIDED BY STATE DEPARTMENTS OF EMPLOYMENT SECURITY.

Employment and Unemployment. Rates of unemployment at the county level are projected under baseline conditions using 1975-78 historical unemployment rate data. These projections are displayed in Tables 4.2-6 and 4.2-7. Baseline projections of labor force participation and unemployment rates jointly determine projected employment at the county level using the labor force concept of employment by place of residence.

Frictional and structural unemployment are assumed to imply a minimum achievable regional unemployment rate of 3 percent. The excess of baseline unemployment above 3 percent is defined as the resident labor force available for direct and indirect employment as a result of M-X deployment.

Because of the probable occupational characteristics of these unemployed persons, 30 percent of the available resident labor force is assumed to be employable in project construction, 20 percent is assumed employable in project operations, and the remaining 50 percent is assumed indirectly employable as a result of M-X. This disaggregation applies to the available resident labor force as a whole, not to specific individuals within it. These estimates are somewhat uncertain because data on the occupational characteristics of the unemployed are difficult to interpret. In the case of construction, the assumption that 30 percent of the available resident labor force is employable on the project is consistent with the large share of less skilled labor in total project construction personnel requirements. It also is consistent with the 20 percent share of more manual occupations - farming/fishing/forestry, machine trades, bench work, and structural work - in total ensured unemployment in the second quarter of 1978 in a major study region SMSA (Las Vegas, Nevada).

4.3 REGIONAL EXCESS LABOR DEMAND AND IN-MIGRATION

The small local economies within the deployment region have relatively small population and consequently limited indigenous labor supply potential compared to the labor demands of the M-X system. The communities most affected by M-X deployment therefore would experience at least temporary excess demand for labor for construction, operation, and indirect employment. This in turn would lead to labor force in-migration.

Excess labor demand is estimated in three categories: construction, operation, and indirect employment. These distinctions are based on the assumption that different occupational characteristics will be required in each category.

Labor force in-migration is determined by excess labor demand by category, construction, operations, and indirect employment, with adjustments for the labor force participation and unemployment characteristics of the in-migrants. Analytically, the local labor force is assumed to fill project-related jobs as these opportunities arise. When the available resident labor force by category is employed, labor force in-migration is assumed to occur. Many of the dependents of labor force in-migrants are assumed to be indirectly employable as a result of the project, and these dependents would fill any additional indirect employment opportunities which may exist. Remaining jobs indirectly resulting from the project after the available resident labor force and the secondary in-migrant labor force are employed would then prompt additional labor force in-migration.

TABLE 4.2-6. BASELINE UNEMPLOYMENT RATE PROJECTIONS
(PERCENT)
NEVADA/UTAH

COUNTY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BEAVER	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
CLARK	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
EUREKA	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
IRON	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
JUAB	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
LINCOLN	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
MILLARD	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
NYE	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
SALT LAKE/UTAH	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
WASHINGTON	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
WHITE PINE	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1
DEPLOYMENT REGION	6.1	6.1	6.1	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2

SOURCE: DERIVED FROM HISTORICAL DATA PROVIDED BY STATE DEPARTMENTS OF EMPLOYMENT SECURITY.

TABLE 4.2-7. BASELINE UNEMPLOYMENT RATE PROJECTIONS
(PERCENT)
TEXAS/NEW MEXICO

COUNTY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BAILEY	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
CASTRO	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
CHAVES	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
COCHRAN	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
CURRY	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
DALLAM	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
DEAF SMITH	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
DE BACA	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
HALE	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
HARDING	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
HARTLEY	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
HOCKLEY	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
LAMB	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
LUBBOCK	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
MOORE	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
OLDHAM	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
PARMER	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
POTTER/RANDALL	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
QUAY	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
ROOSEVELT	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
SHERMAN	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
SWISHER	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
UNION	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
DEPLOYMENT REGION	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0

SOURCE: DERIVED FROM HISTORICAL DATA PROVIDED BY STATE DEPARTMENTS OF EMPLOYMENT SECURITY.

Because of the possibility of frictional unemployment of the in-migrant labor force, labor force in-migration by type of in-migrant would exceed the excess demand for labor. For example, an excess demand for construction labor of 94 persons would imply in-migration of 100 construction workers given the assumption of 6 percent unemployment among construction workers. This computation is performed for each type of in-migrant.

Table 4.3-1 summarizes the parameter assumptions used in the analysis regarding the labor force and demographic characteristics of the potential in-migrant population. These assumptions relate to household size, the fraction of in-migrants with families, labor force participation rates, and unemployment rates. Each of these parameters is disaggregated by type of in-migrant, and assigned the values shown in the table. These assumptions jointly determine the level of labor force and population in-migration associated with any given level of local excess labor demand.

Marital Status and Household Size. Average family size for military personnel with families is assumed to be 3.33 persons, or 2.33 dependents per member of the military. This is the current estimate by the U.S. Bureau of the Census for all family households in the United States in 1978. Sixty-five percent of all military personnel are assumed to be married, which is roughly consistent with a weighted average of 81.9 percent for officers and 62.1 percent for enlisted personnel. This average figure also is within the range of 63.6-69.7 percent observed on Ellsworth, Malmstrom, Whiteman, Grand Forks, and Holloman Air Force Bases (see U.S. Air Force, TAB A-1 Environmental Narratives for bases listed).

The fraction of construction personnel with families in the region is assumed to be 50.0 percent. This value is based on the findings of the Construction Workers Profile prepared for the Old West Regional Commission in 1975. The commission's survey of construction workers employed on large energy-development projects in the Rocky Mountain states found that 48.9 percent of the workers were married with their families present. The remaining 51.1 percent were either single or married without families present. This analysis treats the latter two categories identically -- that is, no distinctions are made between workers who are married but without their families present and workers who are single. The 50.0 percent of construction workers with families are assumed to have an average family size of 3.60 persons - 2.60 dependents per worker. This estimate again is based on the Construction Workers Profile findings of 3.61 persons per household.

The average household size for other civilian in-migrants is assumed to be 2.80 persons. This estimate is based on the findings of the U.S. Bureau of the Census for the United States in 1978. It assumes that 74.9 percent of these persons are married with an average family size of 3.33, while the remaining 25.1 percent are single.

Labor Force Participation Rates. Dependents of military personnel are presumed to have an average labor force participation rate of 15.0 percent. Construction worker dependents and dependents of civilian operations personnel are assumed to have somewhat higher participation characteristics -- 25.0 and 33.3 percent, respectively. These estimates are extrapolations from the Construction Worker Profile results. For new-comer construction dependents, the Profile reports a ratio of employment to dependent population of 21.5 percent. This analysis consequently assumes a participation rate for construction-worker dependents of

Table 4.3-1. Immigrant labor force and demographic assumptions.

VARIABLE	VALUE
Household size, single military	1.250
Household size, construction workers with families	3.600
Household size, military with families	3.330
Household size, civilian inmigrants	2.800
Fraction of military personnel with families	0.650
Fraction of construction personnel with families	0.500
Labor force participation rate, military dependents	0.150
Labor force participation rate, construction worker dependents	0.250
Labor force participation rate, civilian operation dependents	0.333
Labor force participation rate, other civilian inmigrant dependents	0.500
Unemployment rate, construction workers	0.060
Unemployment rate, military dependents	0.060
Unemployment rate, construction worker dependents	0.060
Unemployment rate, civilian inmigrant dependents	0.060

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Source HDR Sciences.

25.0 percent. Among other new-comer dependents, 30.2 percent were reported to be employed. This study therefore assumes a labor force participation rate of 33.3 percent for these inmigrants. Dependents of civilians who in-migrate to take jobs indirectly related to M-X deployment are assigned a labor force participation rate of 50.0 percent.

Unemployment Rates. Construction workers and all dependents in the labor force are assumed to experience unemployment rates of 6.0 percent. This is consistent with the long-term standard-trend forecast by Chase Econometrics of September 1980 for the United States as a whole. It is less than historical averages for construction workers, though this is reasonable because of the extremely large demands of the project for construction labor. The 6.0 percent rate is very close to the baseline projection of unemployment in the Nevada/Utah region based on 1974-1979 actual data. It is significantly higher than the 4.0 percent baseline unemployment rate projected for the Texas/New Mexico ROI. It is above the projected unemployment rate for each region with M-X deployed.

4.4 SUB-COUNTY ALLOCATION OF IN-MIGRANT POPULATION

This analysis disaggregates county-level estimates of M-X-induced population in-migration into three general places of residence:

- o Communities, with no distinction made among communities;
- o operating bases; and
- o construction camps.

The employment and family status of the principal in-migrant wage-earner is used to estimate the place of residence of the worker and his dependents.

Construction Employment. The portion of DDA and OB construction workers assumed to have their families present (see section 4.3) are assumed to live in communities. The remaining construction workers -- single persons and married persons without families present -- are presumed to be basically full-time residents in construction camps. This assumption would not preclude spending some non-work hours in major metropolitan areas on the fringes of the deployment region. In fact, the incomes of these persons are assumed to be spent in a number of communities throughout the region, reflecting a relatively high degree of mobility. In-migrant workers employed in DDA construction and without families are assumed to live in the construction camps shown in Figures 2.1-1 through 2.1-4. In-migrant workers employed in OB construction and without families present are assumed to live in a construction camp established on the site of the base.

Assembly and Checkout Employment. All assembly and checkout workers are assumed to be in-migrants, and to have no families present. They are allocated to the construction camps or base sites, depending on the location of their employment.

Military Employment. Of all the military operations personnel and their dependents, 80 percent are assumed to live onbase. The remaining 20 percent are allocated to the communities near the base locations.

Civilian Operations Employment. All in-migrant civilian operations personnel and their dependents are assumed to live in communities near the bases.

Indirect Employment. All in-migrating workers indirectly employed by the M-X project, as well as their dependents, are assumed to live in communities in the ROI.

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APPENDIX A

SELECTED PAYROLL DATA FOR SIX U.S. AIR FORCE BASES

Table A-1. Average annual pay by major employment category for six U.S. Air Force bases.

AIR FORCE BASE	AVERAGE ANNUAL PAY (1978 DOLLARS)			
	OFFICERS	ENLISTED PERSONNEL	CIVIL SERVICE	ALL CIVILIANS
Ellsworth	22,276	10,639	13,821	11,049
Grand Forks	21,732	10,503	15,496	13,328
Malmstrom	16,090	8,745	15,544	14,506
Minot	22,111	10,413	15,620	11,605
Warren	19,285	10,162	14,609	11,669
Whiteman	20,784	10,485	16,325	13,875
Average, 6 bases	20,380	10,158	15,236	12,672
Average, 5 bases (excluding Malmstrom)	21,238	10,440	15,174	12,305

3336

NOTE: These bases support Minuteman Missile Operation and are representative of operations at the M-X bases. Differences in pay are the result of differences in the composition of the work-force on the bases.

Source: HDR Sciences calculations based on data from U.S. Air Force *TAB A-1 Environmental Narratives*.

Table A-2. Whiteman, AFB, Knob Noster, MO: Employment and payrolls.

EMPLOYMENT CATEGORY	NUMBER	ANNUAL PAYROLL MAY 1977 (DOLLARS)	AVERAGE ANNUAL PAY MAY 1977 (DOLLARS)	AVERAGE ANNUAL PAY (1978 DOLLARS)[1]
Military[2]	3,256	32,915,407	10,109	11,009
Officers	564	10,764,419	19,086	20,784
Enlisted	2,660	25,610,342	9,628	10,485
Civilian	590	7,517,014	12,741	13,875
Civil Service	441	6,611,214	14,991	16,325
Base Exchange	41	364,081	8,880	9,670
Other Full-Time	108	541,719	5,016	5,462
Total[3]	3,846	40,432,421	10,513	11,449

3337

[1]Adjusted from May 1977 using the proportional change in the implicit price deflator for federal government purchases from 1977:II to 1978 (annual average):154.8/142.1 = 1.089.

[2]Total military employment and payrolls are not equal to the sum of officers and enlisted men employment and payrolls. No explanation is available from the source.

[3]Sum of "Military" and "Civilian" subtotals.

Source: U.S. Air Force, TAB A-1 Environmental Narrative Phase II: Whiteman AFB, Knob Noster, Missouri. Revised 10 August 1977. Pp. 48-49. Price deflators are from Council of Economic Advisors, Economic Report of the President, Washington, D.C., January 1980, p. 207.

Table A-3. Warren AFB, Cheyenne, WY: Employment and payrolls.

EMPLOYMENT CATEGORY	NUMBER	ANNUAL PAYROLL MAY 1977 (DOLLARS)	AVERAGE ANNUAL PAY MAY 1977 (DOLLARS)	AVERAGE ANNUAL PAY (1978 DOLLARS) [1]
Military	3,940	42,115,279	10,689	11,785
Officers	703	12,291,359	17,484	19,285
Enlisted	3,237	29,823,920	9,213	10,162
Civilian	777	8,219,885	10,579	11,669
Civil Service	543	7,192,017	13,245	14,609
Base Exchange	75	422,000	5,627	6,207
Other Full-Time	159	605,868	3,810	4,202
Total	4,717	50,335,164	10,671	11,770

3338

[1]Adjusted from March 1977 using the proportional change in the implicit price deflator for federal government purchases from 1977:I to 1978 (annual average):154.8/140.4 = 1.103.

Source: U.S. Air Force, TAB A-1 Environmental Narrative Phase II: F.E. Warren AFB, Cheyenne, Wyoming. Revised July 1977. Pp. 33-34. Price deflators are from Council of Economic Advisors, Economic Report of the President, Washington, D.C., January 1980, p. 207.

Table A-4. Minot AFB, Minot, ND: Employment and payrolls.

EMPLOYMENT CATEGORY	NUMBER	ANNUAL PAYROLL MAY 1977 (DOLLARS)	AVERAGE ANNUAL PAY MAY 1977 (DOLLARS)	AVERAGE ANNUAL PAY (1978 DOLLARS)[1]
Military[2]	6,577	69,000,000	10,491	11,357
Officers	893	18,231,553	20,416	22,111
Enlisted	5,160	49,613,187	9,615	10,413
Civilian[3]	1,139	12,172,450	10,715	11,605
Civil Service	728	10,500,000	14,423	15,620
Base Exchange	136	762,450	5,606	6,072
Other	275	910,000	3,309	3,584
Total[4]	7,716	81,172,450	10,520	11,393

3339

[1]Adjusted from August 1977 using the proportional change in the implicit price deflator for federal government purchases from 1977:III to 1978 (annual average):154.8/143.0 = 1.083.

[2]The "Military" subtotal does not equal the sum of officers plus enlisted men. No explanation is available from the source.

[3]The "Civilian" subtotal may include a large number of part-time employees, especially in the "Other" category.

[4]Sum of "Military" and "Civilian" subtotals.

Sources: U.S. Air Force, *TAB A-1 Environmental Narrative: Minot AFB, Minot, North Dakota*. Revised 15 August 1977. Pp. 41-42. Price deflators are from Council of Economic Advisors, *Economic Report of the President*, Washington, D.C., January 1980, p. 207.

Table A-5. Malmstrom, AFB, Great Falls, MT: Employment and payrolls.

EMPLOYMENT CATEGORY	NUMBER	ANNUAL PAYROLL MAY 1977 (DOLLARS)	AVERAGE ANNUAL PAY MAY 1977 (DOLLARS)	AVERAGE ANNUAL PAY (1978 DOLLARS)[1]
Military	5,274	48,534,000[2]	9,203	9,966
Officers	877	13,029,520	14,857	16,090
Enlisted	4,397	35,504,480	8,075	8,745
Civilian	697	9,335,880	13,394	14,506
Civil Service	609	8,741,000	14,353	15,544
Base Exchange	42	283,920	6,760	7,321
Other Full-Time	46	310,960	6,760	7,321
Total	5,971	57,869,880[2]	9,692	10,496

3340

[1]Adjusted from August 1977 using the proportional change in the implicit price deflator for federal government purchases from 1977:III to 1978 (annual average):154.8/143.0 = 1.083.

[2]Military and total payrolls have been altered from the original data to conform to available statistical detail. No explanation is available from the source for a $2 million discrepancy between payrolls by employment category and total payrolls.

Sources: U.S. Air Force, *TAB A-1 Environmental Narrative: Malmstrom AFB, Great Falls, Montana*. Revised 15 August 1977. Pp. 4-10. Price deflators are from Council of Economic Advisors, *Economic Report of the President*, Washington, D.C., January 1980, p. 207.

Table A-6. Grand Forks, AFB, Emerado, ND: Employment and payrolls.

EMPLOYMENT CATEGORY	NUMBER	ANNUAL PAYROLL MAY 1977 (DOLLARS)	AVERAGE ANNUAL PAY MAY 1977 (DOLLARS)	AVERAGE ANNUAL PAY (1978 DOLLARS)[1]
Military[2]	5,419	4,860,115	897	11,216
Officers	859	1,492,942	1,738	21,732
Enlisted	4,744	3,984,960	840	10,503
Civilian[3]	726	773,870	1,066	13,328
Civil Service	559	692,756	1,239	15,496
Base Exchange	128	60,922	476	5,951
Other Full-Time	39	20,192	518	6,474
Other Part-Time	24	8,519	355	4,438
Total[4]	6,145	5,633,985	917	11,464

3341

[1]Adjusted from December 1977 using the proportional change in the implicit price deflator for federal government purchases from 1977:IV to 1978 (annual average):154.8/148.6 = 1.042.

[2]Total does not equal the sum of officers plus enlisted men. No explanation is available from the source.

[3]Excluding "Other Part-Time."

[4]Sum of "Military" and "Civilian" subtotals.

Sources: U.S. Air Force, *TAB A-1 Environmental Narrative Phase II: Grand Forks AFB, Emerado, North Dakota*. Revised 19 April 1978. Pp. 58-59. Price deflators are from Council of Economic Advisors, *Economic Report of the President*, Washington, D.C., January 1980, p. 207.

Table A-7. Ellsworth AFB, Rapid City, SD: Employment and payrolls.

EMPLOYMENT CATEGORY	NUMBER	ANNUAL PAYROLL MAY 1977 (DOLLARS)	AVERAGE ANNUAL PAY MAY 1977 (DOLLARS)	AVERAGE ANNUAL PAY (1978 DOLLARS)[1]
Military[2]	5,005	58,435,332	11,675	12,878
Officers	1,050	21,205,494	20,196	21,276
Enlisted	4,664	44,987,302	9,646	10,639
Civilian	993	9,947,345	10,017	11,049
Civil Service	682	8,545,429	12,530	13,821
Base Exchange	106	728,000	6,868	7,575
Other Full-Time	205	673,916	3,287	3,626
Total[3]	5,998	68,382,677	11,401	12,575

3342

[1]Adjusted from January 1977 using the proportional change in the implicit price deflator for federal government purchases from 1977:I to 1978 (annual average):154.8/140.4 = 1.103.

[2]The "Military" subtotal does not equal the sum of officers plus enlisted men. No explanation is given in the source.

[3]Sum of the "Military" and "Civilian" subtotals.

Sources: U.S. Air Force, *TAB A-1 Environmental Narrative: Ellsworth AFB, Rapid City, South Dakota*. Revised March 1977. Pp. 50-51. Price deflators are from Council of Economic Advisors, *Economic Report of the President*, Washington, D.C., January 1980, p. 207.

APPENDIX B

CONSTRUCTION-WORKER DAILY SUBSISTENCE ESTIMATES BY CRAFT

Table B-1. Construction worker daily subsistence estimates, by craft.

CRAFT CATEGORY	DAILY SUBSISTENCE PAYMENT (1978 DOLLARS)
Laborer	16.00
Operating Engineer	16.00
Carpenter	18.00
Teamster	16.00
Cement Mason	16.00
Iron Worker	20.00
Pipefitter	25.00
Electrician	25.00
Overall Average	19.00
Composite	16.50
Estimate Used	18.00[1]

3979

[1]This estimate is equivalent to $20.90 in FY 1980 dollars, using the proportionate change in the GNP implicit price deflator of 176.53/152.05 = 1.161.

Source: Ralph M. Parsons Company, M-X Verifiable Horizontal Shelter.

APPENDIX C

ASSUMPTIONS AND CALCULATIONS FOR PROJECT-RELATED OFFBASE PUBLIC AND PRIVATE INVESTMENT ESTIMATES

PROJECT-RELATED INVESTMENT IN COMMUNITIES

INTRODUCTION

The indirect capital investment data, which are presented per 1,000 M-X operations workers, reflect preliminary assumptions about the extent of indirect jobs generated as a result of the project and the economic-demographic characteristics of in-migrant populations. In addition, the data are computed based upon assumptions about demand or "requirements" for a stock of physical capital to accommodate the in-migrant population, including such community facilities as housing and non-residential buildings, streets and highways, public buildings such as schools, and public and private utilities, as well as unit costs for each type of facility (Murphy/Williams Urban Planning and Housing Consultants, 1978.). Data for three secenarios -- all military personnel housed onbase, 20 percent in communities, and 40 percent offbase -- are shown where applicable, although the final analysis incorporates only the assumption that 20 percent would reside offbase. As the data in Table C-1 show, the amount of offbase public and private capital investments would be especially sensitive to the proportion of military personnel obtaining accommodations in communities. Residency by military personnel in communities rather than onbase would generate demand not only for private housing but for other additional demand not only for private housing but for other additional offbase facilities as well. Compared to the first scenario, total public and private offbase capital investment required would be higher by almost two-thirds when 40 percent are accommodated offbase.

Although the demand for capital investment in offbase facilities would likely be much higher during the peak M-X construction "boom" period than in the long term operations phase, the assumption implicit in the estimation procedure used is that such investments are unlikely to exceed those needed to accommodate the permanent offbase population influx. These investments in construction of facilities, which would represent large amounts of unrecoverable "sunk" capital, are economically justified only if they provide a flow of services or benefits to the population over an extended period of time. Since benefits to the temporary construction-related population would be short-lived, large expenditures for permanent facilities to accommodate the maximum population influx during construction would not be warranted.

The data presented in the tables should be regarded as initial approximations of the amounts of investment in offbase facilities likely to occur. The current version of the community socioeconomic models, described in ETR-28, contain revised procedures and assumptions for computation of indirect investment data. The economic-demographic assumptions which form the basis for the data in Tables C-1 through C-7 include:

1) 1,000 direct operations personnel, consisting of 886 military and 114 civilian workers;
2) 310 military personnel (35 percent) are single and 576 (65 percent) are married;
3) One-fifth of each group would reside offbase: 62 single and 115 married military personnel; the average household size for single personnel is 1.25; the total number of offbase military households consists of 49

Table C-1. Estimated total local public and private capital investment induced per 1,000 M-X operations personnel.

SCENARIO 1: 100 percent Military On Base	Offbase Housing	$ 13,017,000	
	Street Facilities	1,835,016	
	School Facilities	1,564,080	
	Other Buildings for Public Facilities	489,912	
	Utilities (Public and Private)	3,599,779	
	Retail Buildings	4,470,760	
	Services Buildings	1,176,520	
	Office Buildings	900,000	
	TOTAL	= $ 27,053,067	
		= $27,000,000	Per 1,000 Direct Employees
SCENARIO 2: 20 percent Military Off Base	Off-Base Housing	$ 18,650,000	
	Street Facilities	2,629,460	
	School Facilities	2,167,760	
	Other Public Buildings	558,337	
	Utilities (Public and Private)	5,158,235	
	Retail Buildings	4,470,760	
	Services Buildings	1,176,520	
	Office Buildings	900,000	
	TOTAL	= $ 35,711,072	
		= $35,500,000	Per 1,000 Direct Employees
SCENARIO 3: 40 percent Military Off Base	Off Base Housing	$ 24,235,000	
	Street Facilities	3,418,953	
	School Facilities	2,776,928	
	Other Public Buildings	626,762	
	Utilities (Public and Private)	6,704,996	
	Retail Buildings	4,470,760	
	Services Buildings	1,176,520	
	Office Buildings	900,000	
	TOTAL	= $ 44,309,919	
		= $44,500,000	Per 1,000 Direct Employees

3327

Source: HDR Sciences.

Table C-2. Estimated offbase housing investment demands.

SCENARIO 1:	ALL MILITARY HOUSEHOLDS ON BASE					
	Total Housing Units Required[1]	=	378 x	1.05	=	397
	Less Mobile Homes[2]	=	397 x	.25	=	99
	Number Conventional Homes	=			=	298
	Number Single-Family Houses (S.F.)	=	397 x	.50	=	199
	Number Multi-Family Units (M.F.)	=	397 x	.25	=	99
	Total Cost S.F. Construction[3]	=	199 x	$48,000	=	$9,552,000
	Total Cost M.F. Construction	=	99 x	$35,000	=	3,465,000
	Total Residential Construction Cost	=				13,017,000
SCENARIO 2:	20 PERCENT MILITARY HOUSEHOLDS OFF-BASE (164 H.H.)					
	Total Housing units Required	=	542 x	1.05	=	569
	Less Mobile Homes	=	569 x	.25	=	142
	Number Conventional Homes	=			=	427
	Number Single-Family (S.F.)	=	569 x	.50	=	285
	Number Multi-Family (M.F.)	=	569 x	.25	=	142
	Total Cost S.F. Construction	=	285 x	$48,000	=	13,680,000
	Total Cost M.F. Construction	=	142 x	$35,000	=	4,970,000
	Total Residential Construction Cost	=			=	18,650,000
SCENARIO 3:	40 PERCENT MILITARY HOUSEHOLDS OFF-BASE (328 H.H.)					
	Total Housing Units Required	=	706 x	1.05	=	740
	Less Mobile Homes	=	741 x	.25	=	185
	Number of Conventional Homes	=			=	556
	Number S.F.	=	741 x	.50	=	370
	Number M.F.	=	741 x	.25	=	185
	Total Cost S.F. Construction	=	370 x	$48,000	=	17,760,000
	Total Cost M.F. Construction	=	185 x	$35,000	=	6,475,000
	Total Residential Construction Cost	=			=	24,235,000
					=	24,250,000

[1]Total housing units = Number of households x 1.05. 3328-1

[2]25 percent of housing requirements assumed to be supplied by mobile homes, 25 percent by multi-unit housing, and 50 percent by single-family units.

[3]Construction costs, including building materials and on-site labor, are assumed as $48,000 per S.F. unit and $35,000 per M.F. unit.

Source: HDR Sciences, based on planning factors recommended by Murphy/Williams Urban Planning and Housing Consultants, Socioeconomic Impact Assessment: A Methodology Applied to Synthetic Fuels, U.S. Department of Energy, Washington, D.C., 1978.

Table C-3. Estimated street facility costs per 1,000 direct operations employees. (Page 1 of 3)

ASSUMPTIONS:

(1) Arterial Street Length

Residential related = 6.0 linear feet per S.F. House
+ 5.5 linear feet per Mobile Home
+ 5.0 linear feet per M.F. Unit

+ Community Street System = 1.76 x Residential related

(2) Collector Street Length

Residential related = 7.0 linear feet per S.F. House
+17.25 linear feet per Mobile Home
+13.50 linear feet per M.F. Unit

+ Community Street System = 1.1 x Residential related

(3) Minor Street Length

Residential related = 47.0 linear feet per S.F. House
+ 22.0 linear feet per Mobile Home
+ 10.0 linear feet per M.F. Unit

+ Community Street System = 1.1 x Residential related

(4) Cost Per Linear Foot

	1975		Inflation Factor		1978 $
Arterials	= $ 142	x	1.21	=	$ 172
Collectors	= 70	x	1.2.	=	$ 85
Minor	= 45	x	1.21	=	$ 54

3329-1

Table C-3. Estimated street facility costs per 1,000 direct operations employees. (Page 2 of 3)

SCENARIO 1: 100 PERCENT MILITARY HOUSE HOLDS ON BASE

Arterial Street Length Required

6.0 (199) + 5.5 (99) + 5.0 (99) = Residential-Related = 2,234 ft

1.76 (2234) = Community Total = 3,932 ft

Collector Street Length Required

7(199) + 17.25 (99) +13.5 (99) = Residential-Related = 4,438 ft

1.1 (4438) = Community Total = 4,882 ft

Minor Street Length Required

47.0 (199) + 22.0 (99) + 10.0 (99) = Residential-Related = 12,521 ft

1.1 (12,521) = Community Total = 13,773 ft

Cost of Constructing Street System

Arterial:	3,932 ($172)	=	$676,304
Collectors:	4,882 ($ 85)	=	$414,970
Minor:	13,773 ($ 54)	=	$743,742
	Total	=	$1,835,016
		=	$1,850,000

SCENARIO 2: 20 PERCENT MILITARY OFF-BASE

Arterial Street Length Required

6.0 (285) + 5.5 (142) + 5.0 (142) = Residential-Related = 3,201 ft

1.76 (3,201) = Community Total = 5,634 ft

Collector Street Length Required

710 (285) + 17.25 (142) + 13.5 (142) = Residential-Related = 6,362 ft

1.1 (6,362) = Community Total = 6,998 ft

Minor Street Length Required

47 (285) + 22.0 (142) + 10 (142) = Residential-Related = 17,939 ft

1.1 (17,939) = Community Total = 19,733 ft

3329-1

Table C-3. Estimated street facility costs per 1,000 direct operations employees. (Page 3 of 3).

SCENARIO 2: (continued)

Costs of Constructing Street System

Arterials:	5,634 ($172) =	$969,048
Collectors:	6,998 ($ 85) =	$594,830
Minor:	19,733 ($ 54) =	$1,065,582
	Total =	$2,629,460
	=	$2,650,000

SCENARIO 3: 40 PERCENT MILITARY OFF-BASE

Arterial Street Length Required

6.0 (370) + 5.5 (185) + 5 (185) = Residential-Related = 4,163 ft

1.76 (4,163) = Community Total = 7,327 ft

Collector Street Length Required

7.0 (370) + 17.25 (185) + 13.5 (185) = Residential-Related = 8,279 ft

1.1 (8,279) = Community Total = 9,107 ft

Minor Street Length Required

47.0 (370) + 22 (185) + 10 (185) = Residential-Related = 23,310 ft

1.1 (23,310) = Community Total = 25,641 ft

Cost of Constructing Street System

Arterials:	7,327 ($172) =	$1,260,244
Collectors:	9,107 ($ 85) =	$774,095
Minor:	25,641 ($ 54) =	$1,384,614
	Total =	$3,418,953
	=	$3,400,000

3329-1

Source: HDR Sciences, based on planning factors recommended by Murphy/Williams Urban Planning and Housing Consultants, Socioeconomic Impact Assessment: A Methodology Applied to Synthetic Fuels. U.S. Department of Energy, Washington, D.C., 1978.

Table C-4. Estimated offbase school facility costs.

ASSUMPTIONS:	1) 26 pupils per 100 population		
	2) Facility size per pupil = 98 square feet		
	3) Costs = $56 per square foot		
SCENARIO 1:	100 PERCENT MILITARY ON-BASE		
	Off-base Population	= 1,096	
	Number of pupils	= .26 (1,096)	= 285
	Size of facility	= 98 (285)	= 27,930 sq ft
	Cost of facility	= 27,930 ($56)	= $1,564,080
			≈ $1,550,000
SCENARIO 2:	20 PERCENT MILITARY OFF-BASE		
	Off-Base population	= 1,096 + 425	= 1,521
	Number of pupils	= .26 (1,521)	= 395
	Size of facility	= 98 (395)	= 38,710 sq ft
	Cost of facility	= $56 (38,710)	= $2,167,760
			≈ $2,150,000
SCENARIO 3:	40 PERCENT MILITARY OFF-BASE		
	Off-base population	= 1,096 + 850	= 1,946
	Number of pupils	= .26 (1,946)	= 506
	Size of facility	= 98 (506)	= 49,588 sq ft
	Cost of facility	= $56 (49,588)	= $2,776,928
			≈ $2,800,000

3330-1

Note: Onbase school facilities are included in construction personnel estimates for the operating bases and are excluded here to avoid double-counting.

Source: HDR Sciences, based on planning factors recommended by Murphy/Williams Urban Planning and Housing Consultants, Socioeconomic Impacts Assessment. A Methodology Applied to Synthetic Fuels. U.S. Department of Energy, Washington, D.C., 1978.

Table C-5. Estimated development costs to other public facilities.

POLICE:	ASSUME $48 PER CAPITA
	SCENARIO 1: 1,096 ($48) = $ 52,608
	SCENARIO 2: 1,521 ($48) = $ 73,008
	SCENARIO 3: 1,946 ($48) = $ 93,408
FIRE:	ASSUME $39 PER CAPITA
	SCENARIO 1: 1,096 ($39) = $ 42,744
	SCENARIO 2: 1,521 ($39) = $ 59,319
	SCENARIO 3: 1,946 ($39) = $ 75,894
GOVERNMENT ADMINISTRATION:	ASSUME $24 PER CAPITA
	SCENARIO 1: 1,096 ($24) = $ 26,304
	SCENARIO 2: 1,521 ($24) = $ 36,504
	SCENARIO 3: 1,946 ($24) = $ 46,704
HEALTH CARE:	ASSUME $286 PER CAPITA
	SCENARIO 1: 1,096 ($286) = $313,456
	SCENARIO 2: 1,521 ($286) = $435,006
	SCENARIO 3: 1,946 ($286) = $556,556
LIBRARIES:	ASSUME $50 PER CAPITA
	SCENARIO 1: 1,096 ($50) = $ 54,800
	SCENARIO 2: 1,521 ($50) = $ 76,050
	SCENARIO 3: 1,946 ($50) = $ 97,300

3331

Source: HDR Sciences, based on planning factors recommended by Murphy/Williams Urban Planning and Housing Consultants, Socioeconomic Impact Assessments, A Methodology Applied to Synthetic Fuels. U.S. Department of Energy, Washington, D.C., 1978.

Table C-6. Estimated utility development costs (page 1 of 2).

RESIDENTIAL RELATED (PUBLIC)

ASSUMPTIONS:	S.F. Total = $7,256/unit	Sanitary S. - $1,337 Storm S. - 2,339 Water - 3,580
	M.F. Total = $3,134/Unit	Sanitary S. - $ 564 Storm S. - 1,042 Water - 1,528
	Mobile Home Total = $4,826/Unit	Sanitary S. - $ 887 Storm S. - 1,565 Water - 2,374

SCENARIO 1: 199 (7,256) + 99 (3,134) + 99 (4,826) = $2,231,984

SCENARIO 2: 285 (7,256) 142 (3,134) 142 (4,826) = $3,198,280

SCENARIO 3: 370 (7,256) 185 (3,134) 185 (4,826) = $4,157,320

RESIDENTIAL RELATED (PRIVATE)

ASSUMPTIONS: S.F. Gas and Electric - $778/unit

M.F. Gas and Electric - $338/unit

Mobile Home Gas and Electric - $523/unit

SCENARIO 1: 199 (778) + 99 (338) + 99 (523) =$240,061

SCENARIO 2: 285 (778) + 142(338) + 142(523) =$343,992

SCENARIO 3: 370 (778) + 185(338) + 185(523) =$447,145

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Table C-6. Estimated utility development costs (page 2 of 2).

NON-RESIDENTIAL UTILITIES

ASSUMPTION: Residential-related costs x .43 Sanitary S.
x .23 Storm S.
x .23 Water
x .23 Gas/Electric

SCENARIO 1:	Sanitary = .1837 (2,231,984) (.43)	=$176,307
	Storm = .3236 (2,231,984) (.23)	=$166,122
	Water = .4927 (2,231,984) (.23)	=$252,931
	Gas/Elec = 240,061 (.23)	=$ 55,214
SCENARIO 2:	Sanitary = .1837 (3,198,280) (.43)	=$252,635
	Storm = .3236 (3,198,280) (.23)	=$238,042
	Water = .4927 (3,198,280) (.23)	=$362,432
	Gas/Elec = 343,992 (.23)	=$ 79,118
SCENARIO 3:	Sanitary = .1837 (4,157,320) (.43)	=$328,391
	Storm = .3236 (4,157,320) (.23)	=$309,421
	Water = .4927 (4,157,320) (.23)	=$471,112
	Gas/Elec = 447,145 (.23)	=$102,843

SYSTEM-WIDE UTILITY DEVELOPMENT COSTS

SCENARIO 1:	Sanitary [.1837 (2,231,984) + 176,307] .44	=$257,982
	Water [.4927 (2,231,984) + 252,931] .09	=$121,737
	Gas/Elec (240,061 + 55,214) (.33)	=$ 97,441
SCENARIO 2:	Sanitary [.1837 (3,198,280) + 252,635] .44	=$369,670
	Water [.4927 (3,198,280) + 362,432] .09	=$174,440
	Gas/Elec (343,992 + 79,118) (.33)	=$139,626
SCENARIO 3:	Sanitary [.1837 (4,157,320) + 328,391] .44	=$480,520
	Water [.4927 (4,157,320) + 471,112] .09	=$226,748
	Gas/Elec (447,145 + 102,843) (.33)	=$181,496

Source: HDR Sciences, based on planning factors recommended by Murphy/Williams Urban Planning and Research Consultants, Socioeconomic Impacts Assessment: A Methodology Applied to Synthetic Fuels, U.S. Department of Energy, Washington, D.C., 1978.

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Table C-7. Estimated non-residential building development.

NON-RESIDENTIAL BUILDING DEVELOPMENT (not related to percent military off-base)

RETAIL

ASSUMPTIONS:
1) Retail sales = .38 x total gross personnel income (assuming military purchase many items on base.)
2) Retail sales/square foot = $60
3) Personal income: Officers $21,238/year/1978 $
   Airmen 10,440
   Civilian 12,305
   Indirect 12,500
4) Construction Cost = $40/square foot

TOTAL INCOME = 69 (21,238) + 817 (10,440) + 114 (12,305) + 500 (12,500)
= 1,465,422 + 8,529,480 + 1,402,770 + 6,250,000
= $17,647,672

TOTAL RETAIL SALES = $17,647,672 (.38) = $6,706,115
TOTAL SQUARE FEET OF RETAIL SPACE = 6,706,115 ÷ 60 = 111,769 square feet
TOTAL COST OF RETAIL CONSTRUCTION = $40 (111,769) = $4,470,760

SERVICES

ASSUMPTIONS:
1) Services receipts = .10 (total personal income)
2) Services receipts/square foot = $30
3) Construction Costs = $40/square foot

TOTAL SERVICE RECEIPTS = $17,647,672 (.05) = $882,384
TOTAL SQUARE FEET OF SPACE = 882,384 ÷ 30 = 29,413
TOTAL COST OF SPACE = 29,413 (40) = $1,176,520

OFFICE SPACE

ASSUMPTIONS:
1) Office employment = .30 (indirect employment)
2) 150 square feet per employee
3) Cost of construction = $40/square foot

TOTAL SQUARE FEET OF SPACE REQUIRED = .30 (500) (150) = 22,500 square feet
TOTAL COST OF SPACE = 22,500 (40) = $900,000

Source: HDR Sciences, based on planning factors recommended by Murphy/Williams Urban Planning and Housing Consultants, Socioeconomic Impact Assessment. A Methodology Applied to Synthetic Fuels. U.S. Department of Energy, Washington, D.C., 1978. 3333

composed of single personnel plus 115 married or 164, as indicated in Table C-2;

4) One indirect job is generated for each two direct operations workers or 500 indirect jobs for the 1,000 operations workers assumed in the tables;

5) The number of civilian households (378) is comprised of 114 civilian operations workers and 264 indirect worker households. The number of indirect households is less than the 500 jobs due to labor force participation and employment of dependents of military and civilian direct personnel and indirect workers. The appropriate rates used in this analysis are shown in Table 4.3-1.

Other assumptions are shown separately in Tables C-2 through C-7.

APPENDIX D

OVERVIEW OF THE REGIONAL INDUSTRIAL MULTIPLIER SYSTEM

REGIONAL INDUSTRIAL MULTIPLIER SYSTEM

INTRODUCTION

The total economic effect of a project is substantially greater than the direct cost of building and operating the facility since the total includes secondary economic effects as well as the initial investment. The additional, or secondary, effect is estimated through a multiplier relationship: the ratio between the total increase in economic activity as a result of a project and the initial project investment. The initial effect, known as the final-demand change, represents the change introduced into the economy by the project itself. The secondary effect is the sum of the additional economic activity generated in the region by the initial effect. The analyses are particularly important since economic stimulation and new jobs created are often the key benefits of the construction or operations phases of a project, while lost jobs are a major source of controversy when an ongoing project must be terminated.

During construction of a new power generating facility, for example, the initial economic effect is represented by expenditures for equipment and materials purchased from local manufacturers and distributors, and for labor. The local direct suppliers in turn purchase goods and services from other, secondary suppliers (for example, wholesalers). The secondary suppliers in turn rely on other suppliers farther removed from the project. These successive rounds of interindustry purchases and sales are the secondary economic effects of the project.

The size of the regional multiplier depends on the proportion of direct and indirect input requirements that can be supplied by the region's economy, which in turn depends on both the specific needs of the project and the ability of the regional economy to supply the inputs. Conceptually, therefore, there is a different multiplier for every specific combination of industry and site in the nation.

ALTERNATIVE METHODOLOGIES

Economists have developed several alternative means for estimating the total economic effect, given the initial effect. The three main approaches are the economic base model, the econometric model, and the input/output (or I/O) model.

The economic base model provides the simplest approach to estimating total economic effect. This model divides the regional economy into two sectors, one producing goods and services for export to other regions (called the export, or basic, sector), and one producing goods and services for local consumption (called the residentiary, or nonbasic, sector). The income earned (or employment) in the impact analysis requires identifying the initial change in the export sector. The product of this initial change and the multiplier is the total change in income (employment).

In the econometric model, the economy is represented by a set of interrelated equations describing the interactions among economic components. Time series data are assembled for the variables of the model, and regression analysis is used to estimate the coefficients of the equations. The economic impact analysis usually involves introducing the initial change in the appropriate equation of the model and recalculating the other equations to obtain the total impact.

The I/O model describes the flows of goods and services to markets and between industries in a region. Each industry in the economy has a particular set of

inputs required to produce its output, requirements that generally differ from those of other industries. The I/O model describes the structure of the economy and may be used to analyze the implications of the changes in one portion of the economic effects that are set off by the final-demand change. Implicit in this process is a multiplier that relates the total change to a specific initial change.

Each approach has advantages and disadvantages. The economic base model is simple to apply, but it fails to provide results tailored to the specific project being analyzed. Equal initial changes, whether in agriculture or energy supply, will produce equal total changes. The econometric model offers results that are moderately sensitive to differences in the nature of the project, but the data requirements for a long time series for all variables and the time required to assemble and estimate the model generally rule out its use, particularly for areas smaller than a state. The I/O model generally provides more useful industrial detail than the other two. However, while it does not require time series data, an I/O model is usually costly to construct, and applications involving regions smaller than a state are difficult, again because of data limitations.

RIMS MULTIPLIER

HDR-Sciences uses a variation of the I/O approach, known as the Regional Industrial Multiplier System (RIMS).* This system was developed to overcome the cost and/or small-area data limitations associated with traditional approaches, and to provide both geographic and industrial flexibility. It is a system of interrelated data files and computer programs designed to estimate I/O type regional multipliers for any of the industries specified in the Bureau of Economic Analysis (BEA) national I/O model, and for any region that can be defined as one or more counties in the United States.

The system combines several advantages of the economic base and I/O approaches to regional impact analysis to produce regional multipliers that are conceptually similar to I/O multipliers. RIMS relies on secondary data sources; is sensitive to differences between industries; operates at a detailed industrial level; and is relatively inexpensive to apply.

The regional multiplier estimates the portion of succeeding waves of expenditures that occur within a defined region, thus providing a measure of the increased economic activity within the region. RIMS estimates project-specific multipliers needed to estimate changes in regional gross output, regional employment, and regional earnings by first computing the study industry's dependence on other regional industries.

The relationship is used to estimate the multiplier effect of an increase in final demand in a given industry on the regional gross output. Earnings-to-gross-output ratios are then used to translate the output increase into increases in earnings. For any given region, the ratio of employment to earnings is used to obtain an estimate of the total increased employment within the region.

*The RIMS system was developed in the Regional Economic Analysis Division of the Bureau of Economic Analysis, U.S. Department of Commerce. The HDR version of RIMS has been refined and updated by staff to meet client and government requirements.

Each industry requires inputs that are converted to an output, which serves as input to other industries. For example, the manufacture of electric motors requires, as some of its inputs, copper, electricity, labor, and transportation. When the electric motors are completed (are an output) they are purchased by (become inputs to) the copper industry, the electric appliance industry, and others. Some of these suppliers and some of the consumers are located in the region of interest, while others are not. An I/O model ordinarily requires the development of an entire I/O matrix to account for this interdependence. While retaining many of the analytical opportunities of the I/O framework, RIMS avoids the need for this costly process by viewing the gross output multiplier as comprising four elements: the initial change, the direct effect, the indirect effect, and the induced effect.

The initial change component in the multiplier represents project expenditures that will occur in the study region. Since this initial change is exactly equal to project expenditures, it is always represented in the multiplier by unity (1.000). The remaining components, the secondary economic effects, are added to the initial economic effect to provide the total economic effect.

The direct effect component accounts for both the industry input requirements and the ability of the area to meet them. The former is obtained from the national I/O model; the latter is derived from data relating to the study region (U.S. Bureau of the Census, County Business Patterns Program). Inputs required by the study industry but not produced in the region (or produced in insufficient quantity) must be imported by the region, thus reducing the direct effect component of the regional multiplier.

The input requirements are identified in the BEA national I/O model. The first step in regionalization is the evaluation of this set of requirements in light of what is known about the project or specific industry. The suitability of the national model industry for the project analysis is assessed and project-specific adjustments made in the national model input requirements on the basis of available project descriptions or engineering information.

The input requirements that result from this first step represent the technical requirements of the industry. The second step in regionalization reconciles the technical requirements of the industry with the capacity of the region to supply the required inputs. The technical requirements are replaced by regional direct coefficients reflecting the actual purchases of inputs from suppliers within the study region. This step is accomplished with the use of the location quotient, which is a double ratio of the form:

- o industry i employment in study region/total employment in study region
- o industry i employment in the nation/total employment in the nation

County Business Patterns data are used to estimate these location quotients. If the location quotient for a given input is zero, no production is carried on in the region. Thus, all the required input must be imported and the regional direct effect is zero. If the location quotient is equal to or greater than one, production in the region is assumed to be sufficient to supply the study industry, and the regional direct effect is equal to the national direct requirement. In cases where the location quotient is greater than zero but less than one, the region is assumed to

supply some of the input requirement, the proportion being equal to the value of the location quotient.

The location quotient test is applied to each regional industry that potentially supplies inputs to the study industry. The sum of all the resulting regionalized coefficients is the direct component of the regional multiplier.

The indirect component and the induced component are computed as a single combined value in RIMS. The indirect-induced effects are those resulting from expansion of supplier and service industries to meet the needs of the directly affected industry, as well as changes in local consumption expenditures. The indirect interactions measure additional rounds of expenditures and production that result from the initial stimulus. Local consumer's incomes are increased by direct and indirect effects, and some part of the income increases will be spent in the region, stimulating additional economic activity. This effect of increased incomes to local consumers is the induced effect, and is an extension of the indirect component. Estimation of the indirect-induced component is possible through the finding that in an I/O model, under empirically common conditions, the indirect-induced component can be estimated as a linear homogeneous function of the direct component. A sample of 17 I/O models containing 500 observations was used to develop a relationship which is applied to all sectors of the regional economy.

UPDATED RIMS PROGRAM

Implementation of the RIMS methodology requires the articulation of several data bases. National input-output data - provided by the Bureau of Economic Analysis - must be coordinated with county business pattern employment figures - furnished by the Census Bureau. Because of the long time required to develop these data -- particularly the input-output study -- these data are unavoidably several years old by the time they are used.

In contrast to the 1967 tables, used in the initial development of RIMS, the latest (1972) national input-output tables did not produce interindustry direct requirement coefficients. Such coefficients must now be generated through appropriate combination of published "use" and "make" tables.

Each row of a use table shows the sales to each industry and to final users of the output of the commodity named at the beginning of the row. Each column shows the value of the input of commodities and the value added generated in production of the industry named at the head of the column. Each row of a make table reveals the value of each of the commodities produced by the industry named at the beginning of the row. The columns of a make table show the total output of each commodity produced in each industry.

Each industry is assumed to have its own technology, determined by its principal product; in other words all commodities, whether principal or subsidiary, produced in one industry are made by the same process and therefore require the same input structure. This is referred to as the assumption of an industry technology (Stone, Bates, and Bacharach, 1963, p.13). (The assumption of a commodity technology, though perhaps preferable from a theoretical viewpoint, can yield negative coefficients and is not considered suitable for impact analysis.) Under this assumption, an input-output coefficient matrix (A) can be obtained as a matrix

product of appropriately scaled versions of the use (U) and make (V) tables (United Nations, 1968, pp. 49-50). A = BD, where U = Bg and V - Dq. g is a diagonal matrix with industry outputs in the diagonal, and q is a diagonal matrix with commodity outputs in the diagonal. The industry technology was employed to compute an industry coefficients table, using the most disaggregated use and make tables (511 industries) available from the Bureau of Economic Analysis. The household coefficients were calculated as value added divided by total inputs. To extract employee compensation from value added - which consists of employee compensation, indirect business taxes and property-type income - value added was multiplied by the proportion of employee compensation in value added at the broad industrial division level.

To generate regional location quotients, one must know the relative proportions of employment in specific industries in the region to be investigated to those in the nation - since the input-output data are national in nature. Employment estimates for 4-digit SIC industries were obtained from County Business Pattern publications for the latest available year 1976. Since many figures are not revealed, due to disclosure rules, a reconciliation procedure was implemented to estimate employment for nonreported industries. This required hierarchically conforming employment estimates at one level of industrial classification to employment estimates at the next broader level. Since five levels of industrial classification exist, a computer subroutine was written to match any of four given levels with the level immediately above it.

Since the industrial classifications employed by the Bureau of Economic Analysis and the Census Bureau are disparate, a bridge program was written so that location quotients could be computed for each of the input-output industries. This was accomplished by taking the published bridge, (Ritz, Roberts, and Young, 1979, pp. 58-61) and rearranging (sorting) it so that SIC industries - as opposed to I/O industries - were in ascending order. This facilitated the assignment of County Business Pattern employment estimates to the appropriate I/O industries as data are read in from magnetic tape, in order of ascending SIC codes.

Once I/O industry regional employment estimates are obtained in this fashion, regional location quotients (LQs) - the ratios of regional to national industrial concentrations - are computed. These LQs are then applied to the national input-output coefficients - generated under the industry technology assumption - to calculate regional direct multipliers.

This procedure can be summarized in the following four equations. (The dot (.) refers to summing across that subscript.)

$$(1.1)\quad A^r_{ij} = (R_i)(A_{ij})$$

$$(1.2)\quad EC^r = g(P_1, P_2, S)$$

$$(1.3)\quad C^r_{.j} = F(A^r_{.j}, EC^r)$$

$$(1.4)\quad M^r_{.j} = A^r_{.j} + C^r_{.j} + 1$$

where

A^r_{ij} = estimated regional direct coefficient

R_i = regionalizing factor for industry i

A^n_{ij} = national direct I-O coefficient

EC^r = factor describing the economic characteristics of the region

P_1 = agriculture proportion of total nongovernment earnings

P_2 = manufacturing proportion of total nongovernment earnings

S = regional nongovernment earnings divided by national nongovernment earnings--a measure of the economic size of the region

$C^r_{.j}$ = estimated indirect-induced component of the multiplier for industry j

$A^r_{.j}$ = estimated direct component of the multiplier for industry j

$M^r_{.j}$ = estimated total multiplier for industry j

Equation (1.1) shows the employment editing of the national table and the further regionalization by location quotients. Equation (1.3) indicates that the indirect-induced component of the multiplier is estimated as a function of both the direct component and regional economic characteristics, which are specified in (1.2). Equation (1.4) is the multiplier identity. One overall multiplier ($M^r_{.j}$) is estimated for each column industry. The multiplier represents the effect of a change in final demand for each column industry's output on the total regional output of goods and services, as well as the associated effects on regional earnings (Cartwright, 1979).

APPENDIX E

IMPACTS OF LARGE NON-M-X-PROJECTS ON TEXAS/NEW MEXICO REGIONAL POPULATION

Impacts of Large Non-M-X Projects on Texas/New Mexico Regional Population

Tolk 1 and Tolk 2 Power Plants. The Southwestern Public Service Company is planning and building two large coal-fired electrical generating units in Lamb County, Texas. Each would have the capacity to produce 543 MW of electricity, with a capital cost of $220 million for each plant.

Construction of Tolk 1 currently is underway, and the unit should be online in mid-1982. Construction of Tolk 1 will require a peak of 650 workers in the spring of 1981. Construction of Tolk 2 will begin in 1982 and be completed in 1985. The Tolk 2 plant also will require a peak of 650 construction workers, with this peak occurring in the spring of 1984.

The build-up of operations personnel for Tolk 1 began in October 1980, and will reach a steady state of 100 to 120 persons by late 1981. Some operations personnel for Tolk 2 will start work in the fall of 1983, and will reach 30 by 1985. The total operating staff for both plants combined therefore is expected to be 130-150 people.

According to the manager of plant construction (Mr. Pete Smith, (806) 378-2121), few of the construction workers currently employed on Tolk 1 have their families near the site. Instead, most commute from their homes in Amarillo, Lubbock, Clovis, and elsewhere in the region. This pattern is likely to continue for construction of Tolk 2. Operations personnel probably would relocate to communities nearer the site, though the number of such persons is quite small.

Of the peak employment of 650 jobs, this analysis assumes that 100 would be filled by persons in Lamb County. If each of these direct jobs induces 0.5 indirect jobs in the county, the total employment impact in Lamb County would be 150 workers. The rest of the project's employment effects would be dispersed so widely over the region that no significant impacts in any single area are anticipated.

The Texas State Water Board's projected population of Lamb County during the 1980-1985 period is a constant 17,400 persons. Assuming a continuation of 1975-78 behavior for labor force participation and unemployment (an average participation rate of 42.8 percent and unemployment of 4.3 percent), projected employment (using the labor force concept) in the county would total 7,100 persons. Peak project employment of 150 persons represents 2 percent of this baseline projection. Most of the jobs created by the power plants could be filled by current residents of Lamb County projected to be unemployed, though some inmigration is likely because of possible mismatches between the occupational demands of the project and the skills of local-area residents.

To account for these small levels of project-induced in-migration, the "high growth" baseline for Lamb County is assumed to be 17,500 through 1995, compared to 17,300-17,400 projected under the trend growth baseline.

Interstate 27. The Texas Department of Highways and Public Transportation is planning major improvements to Interstate 27 over a 115-mile stretch from Amarillo to Lubbock (Mr. Ron Hilliar, senior design engineer, Amarillo office, (806) 355-5671, and Mr. Wall, district engineer, Lubbock office, (806 745-4411). The project is broken into two subprojects with the 24-mile section north of Swisher County managed from the Amarillo office and the remaining 91-mile portion

managed from the Lubbock office. Both sections now are under construction, with approximately 100 workers employed on the Amarillo portion and 200 workers on the Lubbock section. This workforce of 300 persons is expected to continue activities through 1986, with a decline in project employment thereafter, and completion anticipated in 1988-89. No significant numbers of operations personnel are associated with the project.

These project labor demands are extremely small compared to the size of the labor force in the Amarillo and Lubbock SMSAs. No adjustments are made to the baseline projections to account for this project.

Amoco CO_2 Pipeline. The Amoco pipeline project is designed to bring CO_2 from wells in Colorado to the Texas/New Mexico area. It would traverse Union, Harding, Quay, Curry, and Roosevelt counties in the M-X deployment region. The CO_2 delivered by the pipeline would be used for tertiary recovery of crude oil, a process which has been tested on an experimental basis but not yet applied commercially. The Amoco project bears a capital cost of approximately $300 million (Mr. Don Currens, engineering manager, Houston, (713) 652-5683, and Mr. E. E. Schmidt, Hood Construction Co., Los Angeles, (213) 685-5640).

Construction of the pipeline is expected to require approximately six months, and probably would start in the last quarter of 1983. The project would require two crews of 300 workers each, laying 15,000 feet of pipe daily for seven months to complete the planned 400-mile pipeline. The project's employment requirements consequently consist of about 600 workers during late 1983 and early 1984.

Assuming an employment multiplier of 1.75 for the five-county region through which the pipeline would be built, the project's 600 direct jobs would generate an additional 450 indirect jobs, for a total employment impact within the five-county area of 1,050 jobs.

Baseline population projections from the University of New Mexico's Bureau of Business and Economic Research indicate a population for the five-county area of 78,000 during this period. Projecting the region's 1975-78 average labor force participation rate of 39 percent and unemployment rate of 5 percent, baseline employment (labor force concept) in the five-county area would be about 29,000 persons in 1984. Project-related employment of 1,050 jobs represents 3.6 percent of this baseline projection.

Since much of the project is located within long commuting distance of Amarillo and Lubbock, many of the project's employees would reside in these metropolitan areas. If half of the 600 direct employees do so, a total of 750 jobs would be filled by residents of the five-county area. Assuming that 250 of these jobs are filled by area workers who otherwise would be unemployed, the remaining 500 jobs would be filled by in-migrants to the area. If the ratio of population to employment for these in-migrating workers is 2.3 (the U.S. average for 1979), the population of the five-county area would increase by 1,150 persons during 1983-84. This represents 1.5 percent of the area's baseline population. The population of each of the five counties traversed by the pipeline therefore is assumed to increase by 1.5 percent above the baseline projection during 1983 and 1984.

Shell-Mobil Co_2 Pipeline. Shell and Mobil plan to construct a pipeline to transport CO_2 across New Mexico in a northwest-southeast direction. A total of ten

New Mexico counties would be traversed by the pipeline. Within the region of influence of the M-X system, however, only Chavez and DeBaca counties would contain portions of the pipeline.

The pipeline would require 1300-1400 workers during the peak construction phase from April 1982 to June 1983. These workers would be spread over the ten-county area traversed by the pipeline. It is reasonable to assume that one crew of 300 persons would be employed in Chavez and DeBaca counties during 1982-83. If half of the crew lives in these counties, and if the ratio of total project-related employment to direct employment is 1.3, the project would generate a total of about 200 jobs in Chavez and DeBaca counties. Projecting the 1975-78 average labor force participation rates and unemployment rates for these counties implies a level of employment in Chavez County of 19,800 and in DeBaca County of 1,000 in 1982-83. Pipeline-related employment would represent 1 percent of this two-county total.

Since the projected unemployment rate in Chavez County is 6 percent, many of the pipeline-related jobs could be filled by area workers who otherwise would be unemployed. The small number of remaining jobs generated by the project would be within the normal employment growth projected for Chavez County under baseline conditions. As a consequence, no alterations are made to the baseline projections to account for this project.

Arco CO_2 Pipeline. Arco plans to build a pipeline to transport CO_2 across the potential M-X deployment region from north to south through Union, Quay, Curry, and Roosevelt counties. The cost of the pipeline is approximately $200 million, with a peak construction-personnel requirement of about 600 workers. The peak of construction activity would occur between the fall of 1982 and the fall of 1983.

The economic and demographic impacts of the pipeline would be very similar to those of the Amoco pipeline project discussed previously. The labor and materials demands of the two projects are similar, and both projects are located in the same area. Peak activity on the Arco pipeline is scheduled approximately a year earlier than that on the Amoco project. The baseline populations of the four affected counties consequently are increased by 1.5 percent in 1982-83 to account for the impacts of the Arco pipeline. For the four counties traversed by both pipelines, the projected 1983 population under high-growth conditions reflects the combined impacts of the two projects.

San Marco Coal Slurry Pipeline. The San Marco Pipeline Company plans to build a 900-mile coal slurry pipeline, 80 miles of which would cross Union County in the northeastern corner of New Mexico. At the peak of construction activity from fall 1984 through spring 1985, approximately 600 workers would be employed in building the pipeline.

If half of the project's direct employees reside in Union County, and assuming the project has an employment multiplier within the county of 1.25, total employment creation in Union County as a result of the project is 375 jobs. Projecting into the future the 1975-78 average labor force participation and unemployment rates of 45.6 and 4.2 percent, employment in Union County (labor force concept) would be approximately 2100 persons. Project-related employment of 375 jobs represents 17.9 percent of this baseline projection.

Given the relatively low projected rate of unemployment, virtually all of the 375 workers would be in-migrants. If the average ratio of population to employment for these in-migrants is equal to the 1979 U.S. average of 2.3, the population impact of the project would be 860 persons. Since the peak of construction activity would be observed only during portions of 1984 and 1985, the annual average population impact would be somewhat less than 860 persons. Union County population is assumed to increase by 500 persons in 1984 and 750 persons in 1985 above trend-growth conditions as a result of the San Marco pipeline. In 1984, these impacts are added to the smaller impacts of the Amoco pipeline.

Table E-1 summarizes the adjustments made to the baseline projections of the University of New Mexico's Bureau of Business and Economic Research and the Texas State Water Board in order to account for the likely effects of major non-M-X projects in the Texas/New Mexico deployment region.

Table E-1. Adjustments to baseline population projections to account for major non-M-X projects, Texas/New Mexico deployment region.

COUNTY AND PROJECT	1982	1983	1984	1985
Lamb County, TX				
Trend-growth Baseline	17,400	17,400	17,400	17,400
Impact of Tolk 1 and 2	100	100	100	100
High-growth Baseline	17,500	17,500	17,500	17,500
Curry County, NM				
Trend-growth Baseline	43,870	44,010	44,150	44,290
Impact of Amoco	—	660	660	—
Impact of Arco	660	660	—	—
High-growth Baseline	44,530	45,330	44,810	44,290
Harding County, NM				
Trend-growth Baseline	1,050	1,030	1,010	1,000
Impact of Amoco	—	15	15	—
High-growth Baseline	1,050	1,045	1,025	1,000
Quay County, NM				
Trend-growth Baseline	11,230	11,250	11,270	11,290
Impact of Amoco	—	170	170	—
Impact of Arco	170	170	—	—
High-growth Baseline	11,400	11,590	11,440	11,290
Roosevelt County, NM				
Trend-growth Baseline	16,610	16,670	16,730	16,800
Impact of Amoco	—	250	250	—
Impact of Arco	250	250	—	—
High-growth Baseline	16,860	17,170	16,980	16,800
Union County, NM				
Trend-growth Baseline	4,850	4,830	4,810	4,800
Impact of Armoco	—	70	70	—
Impact of Arco	70	70	—	—
Impact of San Marco	—	—	—	—
High-growth Baseline	4,920	4,970	5,380	5,550

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Sources: Trend-growth projections are from the Texas State Water Board and the University of New Mexico, Bureau of Business and Economic Research. Impact estimates and high-growth projections have been calculated by HDR Sciences, October 1980.

Note: Only in Lamb County, TX, do the changes shown persist through the entire projection period (through 1994). For the other counties shown, no adjustments are made to the trend-growth baseline from 1986 through 1994.

APPENDIX F

DETAILED OPERATIONS PERSONNEL REQUIREMENTS OF THE M-X SYSTEM

M-X manpower summary, 17 July 1980. (Page 1 of 2)

	PERSONNEL	FIRST OPERATING BASE				SECOND OPERATING BASE				CUMULATIVE TOTAL
		OFFICER	AIRMEN	CIVILIAN	TOTAL	OFFICER	AIRMEN	CIVILIAN	TOTAL	
1	Air Division	23	12	8	13	-	-	-	-	13
2	Wing Commander	3	2	2	7	3	2	2	7	11
3	Base Spt. Gp. Cmdr.	3	4	3	10	3	4	3	10	20
4	History	0	1	0	1	0	1	0	1	2
5	Judge Advocate	5	5	6	16	5	5	6	16	32
6	Public Affairs	2	2	6	10	2	2	6	10	20
7	Chaplain	4	4	5	13	4	4	5	13	26
8	Safety	4	7	2	13	4	7	2	13	26
9	Mgmt. Eng. Team	2	8	1	11	2	6	1	9	20
10	Base Administration	2	1	34	37	2	1	31	34	71
11	Base Contracting	3	18	31	52	3	16	29	48	100
12	Director of Operations	78	50	8	136	71	43	8	122	258
13	Comptroller	1	1	1	3	1	1	1	3	6
14	Accounting and Finance	1	31	31	63	1	27	28	56	119
15	Budget	1	3	2	6	1	2	2	5	11
16	Management Analysis	1	5	1	7	1	4	1	6	13
17	Data Automation	23	27	2	52	1	12	11	24	76
18	CBPO (Include Chief of Personnel)	5	10	44	59	5	3	28	36	161
19	DO	-	-	21	21	-	-	19	19	40
20	MOM	9	292	7	308	9	292	7	308	616
21	MMS	6	614	0	620	6	614	0	620	1240
22	MMS (Include MSL Assembly)	10	313	0	323	4	251	0	255	578
23	Main. Maint. Sq	3	16	1	120	-	-	-		120
24	MOF/CAMS	18	409	10	437	-	-	8	8	45
25	MSL Ops. Sq	37	1	1	39	37	1	1	39	78
26	ALCC Ops. Sq	23	10	1	34	23	10	1	34	68
27	Base Supply	6	183	34	223	6	171	33	210	433

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M-X manpower summary, 17 July 1980. (Page 2 of 2)

	PERSONNEL	FIRST OPERATING BASE				SECOND OPERATING BASE				CUMULATIVE TOTAL
		OFFICER	AIRMEN	CIVILIAN	TOTAL	OFFICER	AIRMEN	CIVILIAN	TOTAL	
28	Fuels	1	134	2	137	1	107	1	109	246
29	Transportation	5	218	192	415	5	208	180	393	808
30	Security Police Gp.	2	86	1	89	2	86	1	89	178
31	Law Enforcement	14	449	7	470	3	256	-	259	729
32	Security	20	780	14	814	17	801	14	832	1646
33	Civil Engineering	19	625	388	1032	19	621	362	1002	2034
34	Food Service	1	127	166	294	1	116	162	279	573
35	Services	2	13	6	21	1	15	2	18	39
36	MWR	2	2	41	45	2	1	37	40	85
37	Base Ops. and Tng.	2	30	1	33	2	30	11	43	86
38	Disaster Preparedness	1	3	2	6	1	3	2	6	12
39	Medical	173	384	40	597	73	133	11	217	814
40	MAC Weather	3	13	-	16	3	13	-	16	32
41	MAC Helo Det.	40	192	-	232	-	-	-	-	232
42	AFCC	13	400	10	423	13	352	10	375	798
43	Social Actions	3	0	7	10	3	1	4	8	18
44	Resource Mgmt	2	1	1	4	2	1	1	4	8
45	Log Plans	1	2	1	4	1	2	1	4	8
46	Sal Verification TMS	-	178	-	178	-	178	-	178	356
47	OSI	6	32	3	41	6	25	3	34	75
48	Commissary	-	3	67	70	-	3	48	51	121
	TOTAL	583	5801	1221	7605	349	4437	1083	5869	13474

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*U.S. GOVERNMENT PRINTING OFFICE: [illegible]


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